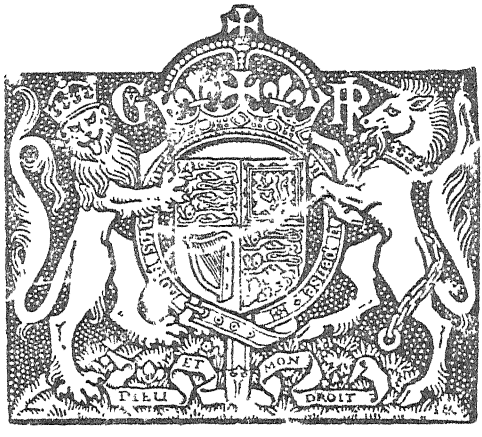


IMPERIAL INSTITUTE
OF
AGRICULTURAL RESEARCH, PUSA.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXIII Part 1

January 1938

CALENDAR, 1938

NOTE 1 —Meetings of the Society are held, with very few exceptions, on alternate Tuesdays throughout the year, accompanied on each occasion by a Show of plants, flowers, etc All meetings, except the Great Spring Show at Chelsea, will be held in the Society s Halls Fellows' tickets admit to all the Shows mentioned in this Calendar, except that on Tuesday, May 24, for which special tickets will be issued

The price of admission for Non-Fellows to the ordinary Fortnightly Meetings is

For two-day Shows, 2*s* 6*d* on the first day, up to 6 P M
1*s* 0*d* ,, ,, after 6 P.M
1*s* 0*d* on the second day.
For one-day Shows, 2*s* 6*d* all day.

A fully licensed Restaurant is available for Fellows and friends

NOTE 2 —*Fellows are requested to note that the Fortnightly Shows will open at* 12 *noon The Daffodil Show, the Early Market Produce Show and the Fruit and Vegetable Show will open at* 1 P M

On the first day of each two-day Show, the Show will remain open until 7 30 P M

NOTE 3 —The following Committees meet on the first day of all Fortnightly Meetings

Orchid Committee	11 45 A M
Fruit and Vegetable Committee .	12 NOON
Floral Committee A . .	12 15 P M.
Floral Committee B . . .	12 NOON
Joint Rock-Garden Plant Committee .	12 30 P M.
Library Committee . . .	3 30 P M.
Scientific Committee . . .	4 P M

As a rule, plants intended for inspection by a Committee should be entered with the Secretary of the Committee at least half an hour before the meeting

Days and times of other meetings of Committees so far as fixed are given in the Calendar

January		*Time.*
10	Entries for General and Teachers' Examinations close	
11	**Fortnightly Meeting.** Flowers in season . . Cypripedium Competition for Amateurs. Lecture (Institute of Landscape Architects) by Mr. Richard Sudell, F I L A, on "Landscape Design in Town Gardens" . .	12 NOON–5 P M 3 30 P M

		Time.
January		
25	**Fortnightly Meeting.** Flowers in season. Special exhibit from Wisley: Winter Stages of Pests and Diseases of Fruits and other Plants .	12 NOON–5 P.M.
	Lecture by Miss D. M. Cayley on "Mushrooms"	3.30 P.M.
31	Entries for British Floral Art Diploma Spring Examination close.	
February		
1	Entries for National Diploma in Horticulture Examinations close.	
8	**Fortnightly Meeting.** Flowers in season . .	12 NOON–5 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	Lecture by Mr. G. W. Robinson on "New Introductions for the Rock Garden" . .	3.30 P.M.
12	Entries for Chelsea Show close.	
16	British Floral Art Diploma. Written Examination.	
22	**Fortnightly Meeting.** Flowers in season . .	12 NOON–7.30 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	ANNUAL GENERAL MEETING . . .	3 P.M.
23	**Second day of Meeting**	10 A.M.–5 P.M.
March		
8	General Examination in Horticulture (Seniors and Juniors).	
8	**Fortnightly Meeting.** Flowers in season . .	12 NOON–7.30 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Lecture by Mr. R. B. Dawson on "The Upkeep of Garden Lawns"	3.30 P.M.
9	**Second day of Meeting**	10 A.M.–5 P.M.
9	*Demonstration at Wisley (weather permitting): Seed Sowing—Indoors and Outdoors . .	2–4 P.M.
10	*Second day of Demonstration	2–4 P.M.
16	*Demonstration at Wisley (weather permitting): Rose Pruning	2–4 P.M.
17	*Second day of Demonstration . . .	2–4 P.M.
16–17	British Floral Art Diploma. Practical Examination.	
19	Teachers' Examination in School and Cottage Gardening.	
22	**Fortnightly Meeting.** Flowers in season . . Cymbidium Cup and Trophy Competitions for Amateurs and Horticultural Traders.	12 NOON–7.30 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Lecture by Captain F. Kingdon Ward on his Expedition to Burma	3.30 P.M.
23	**Second day of Meeting**	10 A.M.–5 P.M.
26	London Gardens Society. Exhibition of Spring Flowers (Old Hall)	1–7 P.M.
29	Alpine Garden Society's Show (Old Hall). .	1–7.30 P.M.
	Joint Rock-Garden Plant Committee .	12.30 P.M.
30	Second day of Alpine Garden Society's Show .	10 A.M.–5 P.M.
April		
5	**Fortnightly Meeting.** Flowers in season . . Sewell Medal Competitions for Alpines and Rock-Garden Plants for Amateurs and Horticultural Traders.	12 NOON–7.30 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Joint Iris Committee	12.45 P.M.
	Lecture by Professor H. H. Hu on "Plant Hunting in China"	3.30 P.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

April		*Time.*
6	**Second day of Meeting**	10 A.M.–5 P.M.
	Lecture (Institute of Landscape Architects) by Captain O'Kelly, A.I.L.A., on "Parks and Playgrounds"	3.30 P.M.
6	Entries for Early Market Produce Show close.	
6	*Demonstrations at Wisley (weather permitting): (1) Spring Spraying of Fruit Trees; (2) Shrub Pruning	2–4 P.M.
7	*Second day of Demonstrations . . .	2–4 P.M.
9	Entries for Daffodil Show close.	
12	**Daffodil Show.** (See special schedule) . .	1–7.30 P.M.
	Special exhibit from Wisley: Pests and Diseases of Daffodils.	
	Early Market Produce Show (Old Hall) . . (See special schedule.)	1–7.30 P.M.
	Fruit and Vegetable Committee . .	12 NOON
	Narcissus and Tulip Committee . .	12 NOON
	Lecture by Mr. A. L. Simon on "Unusual Vegetables for the Garden and the Cook" . .	3.30 P.M.
	Iris Group Meeting in Restaurant (Old Hall). Speaker, Mr. R. W. Wallace . . .	4.15 P.M.
13	**Second day of Shows**	10 A.M.–5 P.M.
20	British Carnation Society's Show (New Hall) .	1–7.30 P.M.
(Wed.)	Joint Perpetual-flowering Carnation Committee	12 NOON
21	Second day of Show	10 A.M.–5 P.M.
26	**Fortnightly Meeting. CONFERENCE ON FLOWERING TREES AND SHRUBS** (other than Rhododendrons). Flowers in season. Flowering Trees and Shrubs.	
	Shrub Competition for Amateurs.	
	Odontoglossum Competition for Amateurs .	12 NOON–7.30 P.M.
	National Auricula and Primula Society's Show (Old Hall)	12 NOON–7.30 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Joint Iris Committee	12.45 P.M.
	CONFERENCE: Session 3–5 P.M. Introductory Address by the President. Arrangement of Flowering Trees and Shrubs, including their use on Walls, Rock Gardens, etc.	
27	**Second day of Meeting and Conference** . .	10 A.M.–7.30 P.M.
	CONFERENCE: First Session, 11 A.M.–1 P.M. Cherries, Crabs and their Allies. Brooms and the Cistus Families.	
	Second Session, 2.30–5 P.M. Cotoneasters, Viburnums and Berberis. Lilacs, Philadelphus, Deutzias, Weigelias, Hibiscus and Escallonias.	
28	**Third day of Meeting and Conference** . .	10 A.M.–5 P.M.
	CONFERENCE: First Session, 11 A.M.–1 P.M. Flowering Trees and Shrubs for various climates and soils. Propagation. Pruning.	
	Second Session, 2.30–5 P.M. Other Families of Flowering Trees and Shrubs. Magnolias and Camellias.	

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

		Time.
April		
29	**Excursions to Gardens.** (The full Programme of the Conference may be obtained from the Secretary, R.H.S. Offices.)	
30	National Diploma in Horticulture. Written Examination.	
May		
1	Entries close for the examination for the National Certificate in Elementary Horticultural Practice.	
3	Rhododendron Association's Show (New Hall) .	1–7.30 P.M.
	Alpine Garden Society's Show (Old Hall) . .	1–7.30 P.M.
	Joint Rhododendron Committee . .	12.15 P.M.
	Joint Rock-Garden Plant Committee .	12.30 P.M.
4	Second day of Rhododendron and Alpine Shows	10 A.M.–5 P.M.
10	**Fortnightly Meeting.** Flowers in season . . Sewell Medal Competitions for Alpine and Rock-Garden Plants for Amateurs and Horticultural Traders.	12 NOON–7.30 P.M.
	Narcissus and Tulip Committee . .	11 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Joint Iris Committee	12.45 P.M.
	Lecture by Mr. H. Stevens on "Flower Decoration"	3.30 P.M.
	Lily Group Meeting in Restaurant, Old Hall (Question and Answer Meeting) . . .	4.30 P.M.
11	**Second day of Meeting**	10 A.M.–5 P.M.
24 (Tues.)	**CHELSEA SHOW.** Royal Hospital Gardens, Chelsea, S.W. 3. (See special schedule.) Admission of Fellows by special invitation only	2–8 P.M.
	Joint Iris Committee	11.15 A.M.
	Joint Rock-Garden Plant Committee .	10.30 A.M.
	Fruit and Vegetable Committee . .	10.30 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Narcissus and Tulip Committee . .	11.15 A.M.
	Orchid Committee	12.15 P.M.
	Floral Committee A	12.15 P.M.
	Floral Committee B	12.15 P.M.
25 (Wed.)	**CHELSEA SHOW.** Royal Hospital Gardens, Chelsea, S.W. 3. Private view for holders of Fellows' tickets only	8 A.M.–12 NOON
	Public admitted from noon	12 NOON–8 P.M.
26 (Thurs.)	**CHELSEA SHOW.** Royal Hospital Gardens, Chelsea, S.W. 3. Private view for holders of Fellows' tickets only	8–10 A.M.
	Public admitted from 10 A.M. . . .	10 A.M.–8 P.M.
27 (Fri.)	**CHELSEA SHOW.** Royal Hospital Gardens, Chelsea, S.W. 3	9 A.M.–5 P.M.
June		
8 (Wed.)	**Fortnightly Meeting.** Flowers in season . . Sewell Medal Competition for Alpines and Rock-Garden Plants for Amateurs only.	12 NOON–7.30 P.M.
	Iris Society's Show	1–7.30 P.M.
	Joint Delphinium Committee . . .	11.15 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Joint Iris Committee	2.15 P.M.
	Iris Group Meeting and Lecture by Mr. G. P. Baker on "Irises for Beginners" (Lecture Room, New Hall)	3.30 P.M.
9	**Second day of Meeting** and Iris Society's Show .	10 A.M.–5 P.M.
	Lecture (Institute of Landscape Architects) by Lady Allen of Hurtwood, F.I.L.A., on "The Future of Landscape Architecture in England"	3.30 P.M.

		Time.
June		
10	Teachers' Advanced Practical Examination at Wisley.	
13–17	National Diploma in Horticulture. Preliminary Practical Examinations at Wisley.	
21–24	National Diploma in Horticulture. Final Practical Examinations at Wisley.	
21	**Fortnightly Meeting.** Flowers in season . . Shrub Competition for Amateurs.	12 NOON–7.30 P.M.
	London and South of England Viola and Pansy Society's Show	12 NOON–7.30 P.M.
	Cactus and Succulent Society's Show (Old Hall)	12 NOON–7.30 P.M.
	Joint Delphinium Committee . . .	11.15 A.M.
	Joint Rhododendron Committee . .	11.15 A.M.
	Joint Iris Committee	12.45 P.M.
	Lecture by Mr. E. A. Bunyard, F.L.S., on "Old-fashioned Roses"	3.30 P.M.
	Lily Group Meeting in Restaurant, Old Hall. Discussion on "The Arrangement of Lilies in the Garden"	4.30 P.M.
22	**Second day of Meeting** and Cactus and Succulent Society's Show	10 A.M.–5 P.M.
30	British Delphinium Society's Show (New Hall) .	1–7.30 P.M.
	Joint Delphinium Committee . . .	12.15 P.M.
July		
2	Lily Group Visit to Gardens of Colonel Stephenson R. Clarke at Borde Hill, Sussex, and the Hon. Mrs. P. Spender-Clay at Ford Manor, Lingfield.	
5	**Fortnightly Meeting.** Flowers in season. Amateur Lily Competitions for Amateurs .	12 NOON–7.30 P.M.
	National Sweet Pea Society's Show (Old Hall) .	1–7.30 P.M.
	Joint Delphinium Committee . . .	11.15 A.M.
	Joint Border Carnation Committee . .	11.30 A.M.
	Joint Iris Committee	12.45 P.M.
	Lily Group Discussion on "The Lilies Exhibited." (Lecture Room, New Hall) . .	3.30 P.M.
	Lily Group Dinner (Restaurant, New Hall), followed by a discussion	7 P.M.
6	**Second day of R.H.S. Meeting** . . .	10 A.M.–5 P.M.
12	National Carnation and Picotee Society's Show (Old Hall)	1–7.30 P.M.
	Joint Border Carnation Committee . .	3 P.M.
13	Second day of National Carnation and Picotee Society's Show	10 A.M.–5 P.M.
16	Joint Delphinium Committee at the British Delphinium Society's Provincial Show at Alderley Edge, Cheshire	11.45 A.M.
19	**Fortnightly Meeting.** Flowers in season . . Lily Competitions for Amateurs. Clay Cup: Scented Rose Competition for Amateurs and Horticultural Traders.	12 NOON–7.30 P.M.
	Joint Border Carnation Committee . .	11.30 A.M.
	Joint Iris Committee	12.45 P.M.
	Lecture by Mr. D. B. Crane on "Violas and Pansies"	3.30 P.M.
20	**Second day of Meeting**	10 A.M.–5 P.M.
20	*Demonstration at Wisley (weather permitting): Summer Pruning of Fruit Trees and Shrubs .	2–4 P.M.
21	*Second day of Demonstration . . .	2–4 P.M.
26	Joint Border Carnation Committee . .	11.30 A.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day

		Time.
August		
9	**Fortnightly Meeting.** Flowers in season . . Foremarke Cup and other Gladiolus Competitions for Amateurs and Horticultural Traders.	12 NOON–7.30 P.M.
	Joint Dahlia Committee . . .	11 A.M.
10	**Second day of Meeting**	10 A.M.–5 P.M.
24	*Demonstration at Wisley (weather permitting): Vegetative Propagation of Plants . .	2–4 P.M.
25	*Second day of Demonstration . . .	2–4 P.M.
30	**Fortnightly Meeting.** Flowers in season . .	12 NOON–7.30 P.M.
	Joint Dahlia Committee . . .	11 A.M.
31	**Second day of Meeting**	10 A.M.–5 P.M.
September		
3	London Allotments and Gardens Show Society (New Hall)	2.30–8 P.M.
6	National Dahlia Society's Show (New Hall) .	1–7.30 P.M.
	Alpine Garden Society's Show (Old Hall) .	1–7.30 P.M.
	Joint Dahlia Committee	12.15 P.M.
	Joint Rock-Garden Plant Committee .	12.30 P.M.
7	Second day of National Dahlia and Alpine Garden Societies' Shows	10 A.M.–5 P.M.
9	National Rose Society's Show (both Halls) .	12 NOON–7 P.M.
10	Second day of National Rose Society's Show .	11 A.M.–5 P.M.
13	**Fortnightly Meeting.** Flowers in season . . Competition for Cacti and Succulents.	12 NOON–7.30 P.M.
	Joint Dahlia Committee . . .	11 A.M.
	Lecture by Mr. J. M. S. Potter on "Plums" .	3.30 P.M.
14	**Second day of Meeting**	10 A.M.–5 P.M.
16	London Gardens Society's Show (New Hall) .	2.30–9 P.M.
17	Second day of London Gardens Society's Show	10 A.M.–6.30 P.M.
20	National Chrysanthemum Society's Show .	1–8 P.M.
21	Second day of National Chrysanthemum Society's Show	10 A.M.–5 P.M.
22–24	Provisional date for British Floral Art Diploma Autumn Examination.	
27	**Fortnightly Meeting.** Flowers in season . .	12 NOON–7.30 P.M.
	Joint Dahlia Committee	11 A.M.
	Lecture by Mr. E. A. Bowles, F.L.S., F.R.E.S., V.M.H., on "Flowers in Season" . .	3.30 P.M.
28	**Second day of Meeting**	10 A.M.–5 P.M.
October		
4	Entries for Fruit and Vegetable Show close.	
11	**Fortnightly Meeting** (New Hall) . . .	12 NOON–7.30 P.M.
	Fruit and Vegetable Show (Old Hall). (See special schedule)	1–7.30 P.M.
	Special exhibit from Wisley: Pests and Diseases of Fruit and Vegetables.	
	Joint Dahlia Committee . . .	11 A.M.
	Fruit and Vegetable Committee . .	12 NOON
	Lecture by Mr. A. E. Usher on "Thirty Years an Exhibitor, and Advice to Young Exhibitors"	3.30 P.M.
12	**Second day of Meeting and Show** . . .	10 A.M.–4 P.M.
25	**Fortnightly Meeting.** Orchids, Stove and Greenhouse Plants and Berried Shrubs . .	12 NOON–7.30 P.M.
	Orchid Cup and Trophy Competitions for Amateurs.	
	First Masters Memorial Lecture by Mr. F. J. Chittenden, F.L.S., V.M.H., on "The Behaviour of Plants"	3.30 P.M.
	Lily Group Meeting in Restaurant (Old Hall). Discussion on "Raising Lilies from Seed" .	4.30 P.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

		Time.
October		
26	**Second day of Meeting**	10 A.M.–4 P.M.
	Institute of Landscape Architects: Presidential Address	3 P.M.
November		
8	**Fortnightly Meeting.** Flowers in season . .	12 NOON–5 P.M.
	Flower Arrangement Competition for Amateurs.	
	Second Masters Memorial Lecture by Mr. F. J. Chittenden, F.L.S., V.M.H., on "The Behaviour of Plants"	3.30 P.M.
9	*Demonstration at Wisley (weather permitting): Planting Fruit Trees and Roses . . .	2–4 P.M.
10	*Second day of Demonstration . . .	2–4 P.M.
29	**Fortnightly Meeting.** Flowers in season (New Hall)	12 NOON–5 P.M.
	British Carnation Society's Show (Old Hall) .	1–7.30 P.M.
	Joint Perpetual-flowering Carnation Committee	12 NOON
	Lecture by Dr. M. A. H. Tincker, D.Sc., F.L.S., on "Growth Substances and Horticultural Practice"	3.30 P.M.
30	Second day of British Carnation Society's Show	10 A.M.–5 P.M.
December		
7	*Demonstration at Wisley (weather permitting): Pruning Fruit Trees	2–4 P.M.
8	*Second day of Demonstration . . .	2–4 P.M.
13	**Fortnightly Meeting.** Flowers in season . .	12 NOON–5 P.M.
1939		
January		
10	**Fortnightly Meeting.** Flowers in season . .	12 NOON–5 P.M.
24	**Fortnightly Meeting.** Flowers in season . .	12 NOON–5 P.M.

* Fellows wishing to attend these Demonstrations should inform the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, beforehand, mentioning the day.

PATRONS, 1937.

THEIR MOST GRACIOUS MAJESTIES THE KING AND QUEEN.
HER MOST GRACIOUS MAJESTY QUEEN MARY.
HER MAJESTY THE QUEEN OF ROUMANIA.
H.R.H. THE PRINCESS ROYAL.
H.R.H. THE DUKE OF CONNAUGHT.

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* Elected annually at Annual General Meeting.
† Retire at Annual General Meeting, 1938.
‡ Died 1937.

THE SOCIETY AND ITS WORK.

THE purpose of the Society is to encourage and improve the science and practice of horticulture in all its branches. It consists of Fellows, Associates, Honorary Fellows and Associates of Honour, numbering in all over 35,300, and over 700 Horticultural Societies are affiliated to it.

It is governed by a President and Council of fifteen members, of whom one-fifth retire annually in February, when the election of President, Vice-Presidents, Treasurer, and three new members of Council takes place.

The Society was founded at a meeting held on March 7, 1804, at Hatchard's book-shop in Piccadilly—a fact commemorated by a bronze plaque placed upon the house. Mr. JOHN WEDGWOOD was in the Chair, and there were also present the Right Hon. CHARLES GREVILLE, the Right Hon. Sir JOSEPH BANKS, P.R.S., WILLIAM TOWNSEND AITON, RICHARD ANTHONY SALISBURY, WILLIAM FORSYTH, and J. DICKSON. These gentlemen formed the nucleus of the Horticultural Society of London, and the avowed duty of that Society was " to collect every information respecting the cultivation of all plants and trees " and " to foster and encourage every branch of horticulture."

The meetings of the Society were first held in the rooms of the Linnean Society, then in Regent Street, and for many years they took place at 21 Regent Street ; then for a few months at St. Martin's Place, Trafalgar Square, whence they were transferred under the Presidency of H.R.H. the PRINCE CONSORT to premises of some magnificence at South Kensington, on land now partly occupied by the Imperial Institute.

These premises finally proved too expensive to maintain, and for this and other reasons the Society's offices were removed in 1888 to rooms in Victoria Street, and the meetings took place in the London Scottish Drill Hall, Buckingham Gate, S.W., until 1904, when the Hall and Offices in Vincent Square, built by subscription to commemorate the Society's Centenary, were opened by His Majesty King EDWARD VII. From 1888 under the Presidency of Sir TREVOR LAWRENCE, Bt., and the Secretaryship of the Rev. WILLIAM WILKS, M.A., the story of the Society had been one of progress. This progress continued after the opening of the Hall until the accommodation both for offices and meetings had been outgrown, and in 1928 the New Hall in Greycoat Street was opened by H.R.H. Princess MARY, and the offices in Vincent Square were rearranged and a fine new Library was constructed on the top floor.

The Society was incorporated by Royal Charter, granted on April 7, 1809, and in 1861, on its move to South Kensington, a new Charter was granted to it under the style and title of the Royal Horticultural Society. A supplementary Charter was granted in 1899, and as the Society had continued to increase beyond expectations a new Charter was granted in 1928, coincident with the opening of the New Hall

Fellowship of the Society.

Anyone interested in horticulture is eligible for Fellowship and is invited to become a Fellow. Candidates for Fellowship must be nominated on a special form, a copy of which can be obtained from the Secretary, and the nomination form must be signed by a Fellow. Privileges of Fellowship, which include admission to all meetings and to the Society's Garden at Wisley, the use of the Library, a copy of the JOURNAL, etc., are set out on the Nomination Form. The entry fee is at present in abeyance. The annual subscription is from one to four guineas.

Associates of the Society.

Candidates for election as Associates must be *bona fide* employed in horticulture, and must be nominated by two Fellows. Associates pay 10*s.* 6*d.* per annum.

Honorary Fellows and Associates of Honour

are appointed by the Council.

HONORARY FELLOWS.

AUCHTER, Prof. E. C., U.S. Department of Agriculture, Bureau of Plant Industry, Washington, D.C., U.S.A.

BAILEY, Prof. L. H., LL.D., Litt.D., Dean Emeritus, Bailey Hortorium, Ithaca, New York, U.S.A.

BAKER, F. J., A.R.C.S., Fisherswood, Sharnall Street, Hoo, Rochester, Kent.

BARKER, Prof. B. T. P., M.A., University of Bristol Research Station, Long Ashton, Bristol.

BEAN, W. J., C.V.O., I.S.O., V.M.H., 2 Mortlake Road, Kew, Surrey.

BLACKMAN, Prof. V. H., M.A., Sc.D., F.R.S., Imperial College of Science, S.W.

BÖRGESEN, Dr. F. C. E., Botaniske Museum, Gothersgade 130, Copenhagen K, Denmark.

BOIS, Prof. D. G. J. M., 68 Boulevard Soult, Paris XIIe, France.

CALDER, C. C., B.Sc., B.Sc. (Agr.), F.L.S., Director, Botanical Survey of India, Royal Botanic Garden, Sibpur, nr. Calcutta, India.

CALVINO, Dr. MARIO, Director of the Stazione Sperimentale di Floricultura, San Remo, Italy.

CARPENTER, Prof. G., B.Sc., Rotherwood, St. Catherine's Estate, Broxbourne, Herts.

CARR, Emeritus Prof. the Rev. J. W., M.A., F.L.S., 24 Grosvenor Crescent, St. Leonards-on-Sea, Sussex.

COLLINGE, Dr. W. E., F.S.A., The Yorkshire Museum, York.

COMPTON, Prof. R. H., M.A., F.R.S. (S. Af.), Director, National Botanic Gardens of S. Africa, Kirstenbosch, Newlands, Cape Town, S. Africa.

CORREVON, Dr. H., Jardin d'Acclimatation, Geneva, Switzerland.

COTTON, A. D., O.B.E., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.

DE WILDEMAN, Prof. E., 122 rue des Confédérés, Brussels, Belgium.

DIELS, Prof. Dr. L., Director, Botanischer Garten u. botanisches Museum, Berlin-Dahlem, Germany.

EBBLEWHITE, E. A., LL.D., J.P., F.S.A., 4 Essex Court, E.C. 4.

FEDTSCHENKO, Prof. BORIS, Jardin Botanique Principal, Leningrad, U.S.S.R.

FRIES, Prof. K. R. E., Ph.D., F.M.L.S., Director, Bergianska, Trädgården, Stockholm, Sweden.

GENTIL, LOUIS, 35 Avenue de l'Arbalète, Boitsfort, Belgium.

GIBAULT, GEORGES, 84 rue de Grenelle, Paris, France.

GUSSOW, H. T., LL.D., F.L.S., F.R.S. (Can.), Dominion Botanist, Central Experimental Farm, Ottawa, Canada.

HALL, Rev. J. BERNARD, M.A., Preston Rectory, Lavenham, Suffolk.

HANDEL-MAZZETTI, Dr. H., Custos an der Botanischen, Abteilung des Naturhistorischen Museum, Vienna, Austria.

HENNESEY, EUGENE J., B.A., B.Sc., High Mead, Kanes Hill, West End, Southampton.

HOOG, J. M. C., 86 Koninginneweg, Haarlem, Holland.

HOYT, Mrs. A. SHERMAN, Hillcrest, Buena Vista Av., S. Pasadena, California.

IZQUIERDO, SALVADOR, Moneda 778, Santiago, Chile.

KRELAGE, ERNST H., 6 Stolbergstraat, Haarlem, Holland.

KRICHAUFF, The Hon. FREDERICK, Agricultural Bureau, Adelaide, S. Australia.

LEMPERG, Dr. F., Hatzendorf, Steiermark, Austria.

LOCKIE, GEORGE, Botanic Gardens, King William's Town, S. Africa.

MERRILL, Dr. E. D., F.M.L.S., Gray Herbarium, Cambridge, Mass., U.S.A.

MOORE, Sir FREDERICK W., M.A., F.L.S., V.M.H., Rathfarnham, Co. Dublin.

NEWSTEAD, Emeritus Prof. R., M.Sc., F.R.S., A.L.S., F.R.E.S., St. Mary's Cottage, 67 Handbridge, Chester.

POLE-EVANS, Dr. I. B., C.M.G., M.A., F.L.S., Irene, Transvaal, S. Africa.

POTTER, Rev. M. C., M.A., Sc.D., F.L.S., Corley Croft, New Milton, Hants.

PRAIN, Lt.-Col. Sir DAVID, C.M.G., C.I.E., LL.D., F.R.S., F.L.S., V.M.H., The Well Farm, Warlingham, Surrey.

RAMSBOTTOM J., O.B.E., M.A., F.L.S., British Museum (Natural History), Cromwell Road, S.W. 7.

REHDER, A., A.M., Curator of the Herbarium, Arnold Arboretum, Harvard University, Jamaica Plain, Mass, U.S.A.

RENDLE, A. B., M.A., D.Sc., F.R.S., F.L.S., V.M.H., Talland, The Mount, Fetcham Park, Leatherhead.

SALMON, Prof. ERNEST S., F.L.S., South-Eastern Agricultural College, Wye, nr. Ashford, Kent.

SCHNEIDER, Dr. C. K., Bolivarallee 9, Berlin-Charlottenburg 9, Germany.

SIRKS, Dr. M. J., Genetisch Institut, c/o Botanisch Laboratorium, Rozenstraat, Groningen, Holland.

SKOTTSBERG, Prof. C. J. F., Göteborgs Botaniska Trädgård, Sweden.

SMITH, G. W., O.B.E., F.L.S., Strathclyde, Barbados, British West Indies.

STOUT, Dr. A. B., Director of the Laboratories, New York Botanical Garden, Bronx Park (Fordham Branch P.O.), New York, N.Y., U.S.A.

TANAKA, Prof. TYOZABURO, Taihoku Imperial University, Taiwan, Japan.

TETS VAN GOIDSCHALXOORD, Jonkheer G. F. VAN, Huize't Valckenbosch, Zeist, Holland.

THE MASTER OF THE WORSHIPFUL COMPANY OF FRUITERERS, c/o The Clerk of the Company.

THE MASTER OF THE WORSHIPFUL COMPANY OF GARDENERS, c/o The Clerk of the Company.

TSCHERMAK-SEYSENEGG, Prof. Dr. ERICH, Hochschule für Bodenkultur, Vienna, Austria.

VAN SLOGTEREN, Prof. Dr. EGBERTUS, Laboratorium voor Bloembollenonderzoek, Lisse, Holland.

VANWIJNGAERDEN, A., Directeur de l'Ecole d'Horticulture de l'Etat, Vilvorde, Belgium.

VAVILOV, Prof. Dr. N. I., Director of the Institute of Plant Industry, 44 Rue Herzen, Leningrad, U.S.S.R.

VOLLBRACHT, ADOLF, Austrian Hort. Society, 12 Parkring, Vienna, Austria.

WALLER, ERNEST, Emsallah, Tangier, Morocco.

WORSDELL, W. CROSFIELD, 11 Westbourne House, Twickenham, Middlesex.

WORSLEY, A., J.P., The Cliff, 3 Bath Road, Ventnor, I. of W.

ZAWODNY, M. le Docteur JOSEPH, 105 Moldantein, Czechoslovakia.

ASSOCIATES OF HONOUR.

Established in 1930 and conferred on Persons of British nationality who have rendered distinguished service to Horticulture in the course of their employment. The number of Associates of Honour may not exceed 100 at any one time.

1933 ALEXANDER, JOHN, Niddrie Gardens, Craigmillar, near Edinburgh.
1933 ALLAN, DONALD, c/o Dobbie's Seed Farms, Marks Tey, Essex.
1931 ANDERSON, T. W., c/o Laxton Bros., 63 High Street, Bedford.
1930 ASHMORE, A. J., 10 Desenfans Road, Dulwich, S.E. 21.
1936 BAILEY, WM. H., Eastfield, Waverley Lane, Farnham, Surrey.
1932 BAKER, W. G., Botanic Garden, Oxford.
1930 BANKS, G. H., Glasgow Botanic Gardens, Glasgow.
1934 BARRON, F. S., Westholme, Colville Road, Wisbech, Cambs.
1933 BEATTY, T., 175 Myland Road, Colchester.
1930 BENBOW, J., The Manor House, Kingston Park, Dorchester.
1930 BENNETT, W., 7 Woodcrest Road, Darlington, Durham.
1931 BESANT, J. W., Botanic Gardens, Glasnevin, Dublin, N.W. 3.
1931 BLAIR, C., 5 Royal Terrace, Linlithgow, Scotland.
1930 BLISS, D., V.M.H., Parks Department, 4 Mount Street, Swansea, Glam.
1936 BOLAS, T. WM., The Gardens, Mount Stewart, Newtownards, Co. Down.
1937 BRACE, JOSH, c/o Thomas Rivers & Son, The Nurseries, Sawbridgeworth, Herts.
1934 BRAGGINS, S. W. MACLEOD, Villa Crosa, Via Cuggiola, Strada Romana, Bordighera, Italy.
1931 BREW, E. U., c/o Charlesworth & Co., Ltd., Orchid Growers, Haywards Heath, Sussex.
1930 BROWN, T. W., Ministry of Agriculture, Horticultural Section, Giza (Mudiriya), Egypt.
1931 BULLOCK, A., 158 Northwood Way, Northwood Hills, Middlesex.
1934 BURTON, Miss M. E., Glen View, Lasswade, Midlothian.
1937 CAMPBELL, D., New Lodge, Inner Circle, Regent's Park, N.W. 1.
1932 CHISHOLM, J. S., Edinburgh & East of Scotland College of Agriculture, 13 George Square, Edinburgh.
1933 CHRISTIE, J. S., 424 Lordship Lane, E. Dulwich, S.E. 22.
1933 CLARK, W. B., Superintendent, Links and Parks Department, Town House, Aberdeen.
1931 COATES, A. W., The Gardens, Wakehurst Place, Ardingly, Sussex.
1930 COMBER, J., V.M.H., The Gardens, Nymans, Handcross, Sussex.
1931 COOK, C. H., The Royal Gardens, Sandringham, King's Lynn, Norfolk.
1930 COOK, T. H., Bewdley, South Wootton, King's Lynn, Norfolk.
1930 COOPER, E. W., 2 North Riding, Bricket Wood, St. Albans, Herts.
1930 COUTTS, J., V.M.H., Lasswade, Green Meads, Westfield, Woking, Surrey.
1932 CRAVEN, WILLIAM, Mowbray House, Radipole Park Drive, Weymouth, Dorset.
1931 DAVIDSON, J. J., The Gardens, Ardencraig, Rothesay, Bute.
1932 GIBSON, E., 19 Helix Road, Brixton Hill, S.W. 2.
1930 GILES, W. F., 38 Redlands Road, Reading, Berks.
1930 GUTTRIDGE, J. J., Burwood, Woodlands Road, Aigburth, Liverpool, 17.
1934 HARRISON, A. T., The Gardens, Training Centre, Jordanhill, Glasgow, W. 3.
1930 HARROW, G., Gracefield, 27 Tudor Road, Kingston Hill.
1930 HILL, JOHN, The Gardens, Duntreath Castle, Blanefield, Stirlingshire.
1930 HOLTON, R. H., c/o J. Cheal & Sons, Ltd., The Nurseries, Crawley, Sussex.
1932 HORWOOD, FREDERICK, M.M., Hillside, Picts Hill, Langport, Somerset.
1931 HOSKING, A., 47 Poltimore Road, Guildford, Surrey.
1930 ISBELL, W., 16 St. Mark's Road, Bush Hill Park, Enfield.
1934 JANES, E. R., 12 Brooklyn Drive, Emmer Green, Reading.
1931 JEARY, T. J. P., c/o George Monro, Ltd., 41 King Street, Covent Garden, W.C. 2.
1930 JENKINS, W. A., Faceby, Stokesley, Yorks.
1930 JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.
1930 KETTLETY, A., c/o Blackmore & Langdon, Twerton Hill Nursery, Bath.
1930 LOGAN, W., St. Blaise, 8 Holtwhite Avenue, Enfield, Middlesex.
1931 LONG, E. P., Drax House, Orcheston St. George, Wilts.
1932 LONG, F. R., Superintendent of Public Parks, St. George's Park, Port Elizabeth, Cape Province, Africa.
1931 MCDONALD, F. W., 172 London Road, Reading.
1930 MACFIE, JAMES B., c/o Dobbie & Co., Ltd., Edinburgh.
1932 MCINNES, DONALD, The Gardens, Glamis Castle, Glamis, Angus, Scotland.
1931 MCINTOSH, D. F., c/o R. H. Bath, Ltd., Floral Farms, Wisbech, Cambs.
1930 MCLAREN, J., Superintendent, Golden Gate Park, San Francisco, California.

1931 MACRAE, A., Nairnside, Lintrathen Gardens, Dundee.
1931 MAITLAND, T. D., M.B.E., 20 Craiglockhart Terrace, Edinburgh.
1932 MANN, PHILIP, 1 Stoke Road, Aylesbury, Bucks.
1932 MARKHAM, H., The Gardens, Wrotham Park, Barnet, Herts.
1930 MARLOW, W. J., 205 Richmond Road, Kingston-on-Thames, Surrey.
1931 MATHEWS, J. W., National Botanic Gardens, Kirstenbosch, Claremont, S. Africa.
1930 METCALFE, A. W., Rozel, Hatfield Road, St. Albans, Herts.
1937 MIDDLETON, C. H., 17 Prince's Avenue, Surbiton, Surrey.
1935 MOORE, H. J., Box 61, Islington, Ontario, Canada.
1930 MUDGE, E. C., c/o Barr & Sons, 11/13 King Street, Covent Garden, W.C.
1933 MUSTOE, W. R., O.B.E., 70 Stag Leys, Ashtead, Surrey.
1930 NEAL, E., The Gardens, Tilgate, Crawley, Sussex.
1934 NOBBS, G., Osborne House Gardens, East Cowes, I. of W.
1930 OLIVER, W., c/o John Forbes, Ltd., Buccleuch Nurseries, Hawick.
1930 PAGE, W. H., The Gardens, Chardwar, Bourton-on-the-Water, Glos.
1933 PERFECT, B. F., Gatton Park Gardens, Reigate, Surrey.
1936 PRESTON, F. G., University Botanic Garden, Cambridge.
1931 PRITCHARD, W. J., Marsden Avenue, New Queniborough, nr. Leicester.
1930 PUDDLE, F. C., V.M.H., The Gardens, Bodnant, Tal-y-Cafn, Denbighshire.
1933 RADLEY, S., c/o R. Veitch & Son, Ltd., The Royal Nurseries, Alphington, Exeter.
1934 RAFFILL, C. P., 197 Kew Road, Kew, Surrey.
1930 ROGERS, J., Brooklyn, Villiers Road, Woodthorpe, Nottingham.
1937 ROSE, F. J., Townhill Park Gardens, West End, Southampton.
1930 SCOTT, J. W., c/o Lowe & Shawyer, Ltd., The Nurseries, Eaton Bray, Dunstable.
1930 SHILL, J. E., Westover, Ashford Road, Laleham-on-Thames, Middlesex.
1930 SILLITOE, F. S., M.B.E., 31 Priory Road, Kew, Surrey.
1933 SMITH, SAMUEL, Quay Road, St. Germans, Saltash, Cornwall.
1930 STREET, C., The Gardens, Floors Castle, Kelso, Roxburghshire.
1930 TANNOCK, D., Superintendent, Reserves Department, Botanic Gardens, Dunedin, New Zealand.
1932 TAYLOR, GEORGE, The Gardens, Bulstrode, Gerrard's Cross, Bucks.
1932 TAYLOR, GEORGE M., Links Cottage, Longniddry, East Lothian.
1932 TROUGHTON, FRANCIS, 1 Vernon Park, St. John's, Worcester.
1933 TUCKER, S. W., The Gardens, Longford Castle, Salisbury, Wilts.
1935 TUSTIN, F., The Gardens, Abbotswood, Stow-on-the-Wold, Glos.
1934 USHER, A. E., Ranston Gardens, Blandford, Dorset.
1936 WADDS, A. B., Englefield Gardens, Reading.
1930 WEBSTER, C., The Gardens, Gordon Castle, Fochabers, Elginshire.
1930 WESTON, J. G., Chatsworth Gardens, Bakewell, Derbyshire.
1931 WILLIAMS, R. O., Beit Cattan, Katamon Road, Jerusalem, Palestine.
1932 WOOD, C. F., Park Lodge, Stangham Park, Handcross, Sussex.
1930 WOODWARD, J. G., The Gardens, Barham Court, Teston, Maidstone.
1935 WORT, J., 4 Lidyard Road, Archway Road, N. 19.

FORMER ASSOCIATES OF HONOUR.

1931 ANDREWS, A. (d. 1937).
1930 BEDFORD, A. (d. 1934).
1931 BLAIR, P. C. (d. 1936).
1930 BROWN, J. (d. 1930).
1930 BUSS, F. (d. 1930).
1931 CAMERON, J. (d. 1935).
1930 CARPENTER, G. (d. 1935).
1934 GINGELL, W. B. (d. 1936).
1932 HALES, W. (d. 1937).
1931 HOARE, J. (d. 1932).
1930 HONESS, W. H. (d. 1937).
1930 HOWE, W. (d. 1930).
1933 INGRAM, G. J. (d. 1935).
1930 IRVING, W. (d. 1934).
1930 JOHNSON, W. E. (d. 1937).
1931 JONES, J., O.B.E. (d. 1934).
1932 JONES, J. (d. 1933).
1931 LANE, G. T. (d. 1936).
1931 MACDONALD, J. V. (d. 1936).
1932 MARKHAM, E. (d. 1937).
1931 PATEMAN, T. (d. 1933).
1930 STEWART, L. B. (d. 1934).
1931 TAYLOR, T. W. (d. 1932).
1932 VASEY, A. E. (d. 1934).
1930 WAKELY, C. (d. 1932).

AFFILIATED SOCIETIES.

Any horticultural, allotment, or cottage garden Society may become affiliated to the Royal Horticultural Society on payment of a subscription of one or two guineas. The privileges, among others, include two transferable tickets of admission to all the meetings in the Society's Halls announced in the Calendar and to the Society's Garden at Wisley, a number of special tickets for the Great Spring Show in accordance with the affiliation subscription, two copies of the

Society's JOURNAL as issued, and a copy of the Society's Rules for Judging, the right to purchase at a discount many of the Society's publications, and at cost price the Affiliated Society's Medal and Medal Cards, to apply for a grant of a Banksian Medal and Card, etc., etc.

Fellows are asked to bring to the notice of local Secretaries the great privileges conferred by affiliation; full particulars, together with an application form, can be obtained by applying to the Secretary.

MEETINGS. (See Calendar, pp. 1–7.)

A meeting and exhibition are held usually at fortnightly intervals in the New Hall in Greycoat Street, Westminster, and sometimes the Old Hall in Vincent Square is occupied as well.

There are also special meetings for the Daffodil Show, the Early Market Produce Show, the Great Spring Show at Chelsea, and the Fruit and Vegetable Show.

The times during which the Shows are open are shown in the Calendar, and Fellows are particularly asked to note that, in order to meet the convenience of Fellows who find it difficult to visit the Shows, the two-day Shows have been arranged to commence at the Annual Meeting in February and end at the last meeting in October. The Shows will be open from 12 noon to 7.30 P.M. on the first day, and 10 A.M. to 5 P.M. on the second.

At these meetings there are exhibitions of Flowers, Fruits and Vegetables, to which all horticulturists are invited to contribute. The arrangements for showing are briefly set out in the section dealing with the Committees and their work (pp. 38–59), and at all these meetings Committees appointed for the purpose make recommendations for Awards (p. 30) to the plants before them.

Sundries of a horticultural nature are exhibited at the meetings in December and January, and if space permits on November 29, and at the Great Spring Show; Pictures of Plants, Flowers, and Gardens and Models and Plans of Gardens are also admitted to the Shows in November, December, January and February.

LECTURES.

Lectures on subjects of horticultural interest are given at the fortnightly meetings at 3.30 P.M., as indicated in the Calendar, and in addition discussions have been arranged for those especially interested in Lilies and their allies and in Irises (see pp. 3–6, 15).

CONFERENCE ON FLOWERING TREES AND SHRUBS OTHER THAN RHODODENDRONS.

A Conference on Flowering Trees and Shrubs will be held on April 26, 27 and 28, when a number of interesting papers on the use of flowering trees and shrubs and on specific species will be read. In conjunction with the Conference there will be a Show, and on April 29 there will be excursions.

Full particulars may be obtained from the Secretary, and early notification of attendance is requested.

Lily Group.

The Lily Group consists of Fellows and Associates of the Royal Horticultural Society who are especially interested in Lilies, Nomocharis and Fritillaries. Its object is to provide Members with facilities for meeting to exchange views upon these plants. Membership is open to all Fellows and Associates without additional subscription. Those who wish to join should apply in writing to the Secretary, who notifies Members by post of all meetings. Upon the recommendation of the Lily Committee the Council has arranged five meetings for 1938. The dates and subjects to be discussed will be found in the Calendar. Each discussion will be introduced by one or more speakers who have made a special study of the subject, and thereafter the discussion will be open. All Members are cordially invited to take part, and to bring plants, cut blooms, photographs or lantern slides bearing upon the subject under discussion. Inquiries from beginners will be welcomed.

Iris Group.

The Iris Group has been formed in co-operation with the Iris Society on similar lines to the Lily Group. The Membership is likewise open to all Fellows and Associates without additional subscription, application only to the Secretaries of either Society being necessary. Group members will be notified by post of the meetings. There will be two meetings in 1938. The dates and subjects to be discussed will be found in the Calendar.

Competitive Classes for Amateurs.

Several competitions for amateurs will be held during the year, the dates being given in the Calendar.

At the Exhibition in connexion with the Conference on Flowering Trees and Shrubs in April there will be competitive classes for Flowering Shrubs, and in June there will be further classes. In July there will be classes for Lilies; in August for Gladioli; and in November a Flower Arrangement Competition.

Full particulars can be obtained from the Secretary.

The Lindley Library.

Trustees: The Society acting by its Council.
Keeper: F. J. Chittenden, F.L.S., V.M.H.
Asst. Librarian: W. T. Stearn, F.L.S.

This Library now consists of more than 16,000 volumes and pamphlets, the latter being very important, and is registered as an "Outlier Library" of the Central Library for Students (see regulation 11).

The nucleus of the Library is the fine collection of books and pamphlets formed by the late Dr. Lindley, so long and so honourably

associated with the Society. Large additions have been received and are constantly being made by donations and by purchases by the Society, the largest in recent years being the very important collection of books and illustrations bequeathed by the late Mr. REGINALD CORY.

The original fittings and furnishings of the old Library, the generous gift of the late Sir HENRY SCHRÖDER, were removed from the old and re-erected in the new Library on the third floor of the Offices of the Society in Vincent Square, and the cost of equipment of the stack room was presented by the Trustees of the Carnegie United Kingdom Trust Fund.

The Council confidently asks the assistance of the Fellows and of the general public in its endeavours to supplement the Library. Donations of money, and of horticultural and botanical books and horticultural trade catalogues are earnestly solicited, and may be sent to the Secretary, R.H.S., Vincent Square, S.W. 1.

LIBRARY REGULATIONS.

1. The Library is open daily (Sundays and holidays excepted) from 10 A.M. to 5 P.M. (Saturdays 10 A.M. to 1 P.M.). On two-day Shows at Westminster, it will be open until 6 o'clock on the first day of the Show.

2. The right of closing the Library at any time for purposes of re-arrangement, cleaning, etc., is reserved. It will be closed annually for a fortnight after the second fortnightly meeting of the Society in July, in order that the books may be cleaned and the stock inspected. For this purpose it is absolutely necessary that all books borrowed be returned on or before July 20. During the two weeks which follow Fellows will be able to consult books but not to borrow them.

3. Fellows of the Society have access to the Library at all times when it is open.

4. Gardeners and others, not Fellows or Officers of the Society, must make application to the Secretary for permission to use the Library, and must enter their names and addresses in a book provided for that purpose.

5. Anyone requiring the loan of a book to be taken from the Library must make written application to the Secretary, and loans will be granted on the following conditions, viz. :—

(*a*) That the borrower be personally known to one or more of the Officers of the Society, or produce satisfactory references.

(*b*) That the borrower sign the receipt for the volumes in a book provided for the purpose, before removing them from the premises, or if unable to attend, acknowledge the receipt by post ; and undertake to restore the books in good condition and to comply with the regulations.

(*c*) That not more than three volumes be lent to one person at one time.

(*d*) That borrowers through the post pay the postage both ways.

6. A certain discretion will be used as to what books shall be lent, but rare books which it would be difficult to replace, periodicals, expensive illustrated works and works of reference which are likely to be in frequent requisition within the Library itself may not be removed from the premises.

7. No books may be sent to Fellows resident abroad.

8. All books borrowed must be returned to the Library in good condition within one calendar month from the date of issue, and if sent by post must be properly protected and packed, but an extension of time may be granted on application.

9. The Secretary is empowered to demand of the borrowers such books as are retained beyond the prescribed time, and to take such steps as may be necessary to secure the prompt return of the same.

10. The loss of any book or any damage must be made good by the borrower.

11. Fellows requiring books on loan from the " Outlier " Libraries should make written application either to the Secretary of the Society or to the National Central Library for Students, Malet Place, London, W.C. 1.

12. The Trustees reserve the right of repealing or altering any of these regulations from time to time as may be required.

LIBRARY CATALOGUE.

The catalogue of the Library up to 1927 is still available. Price 5*s*. Orders should be placed with the Secretary.

PRIVILEGES OF CHEMICAL ANALYSIS.

Analyses of soils, manures, water, etc., are made at a reduced rate for Fellows who are not engaged in any horticultural trade or in the manufacture or sale of any substance sent for analysis, and for Affiliated Societies. Full particulars of fees, methods of sampling, etc., can be obtained of the Secretary.

PUBLICATIONS.

The Society's publications include the JOURNAL, now issued to all Fellows monthly, containing an account of the Society's activities, lectures delivered at the fortnightly meetings, articles on horticultural matters specially contributed, descriptions and notes on plants to which awards have been made, accounts of work at Wisley, etc.

CURTIS'S BOTANICAL MAGAZINE, publication of which began in 1787, containing hand-coloured illustrations, descriptions and notes on new plants or plants recently introduced to gardens from abroad, published quarterly, price £3 3*s*. per annum.

The INDEX LONDINENSIS, an index of all illustrations of flowering plants and ferns published between 1753 and 1921, in six volumes, price £5 5*s*. a volume. A supplement up to the end of 1935 is in preparation.

An Index to the Society's JOURNAL from 1838 to 1935, with List of Awards 1859–1935, price 20*s*. in paper, and 21*s*. in buckram.

The LILY YEAR BOOK, price 5*s*. in paper, 6*s*. in cloth, is published annually in autumn, and the DAFFODIL YEAR BOOK, price 5*s*. in paper, 6*s*. in cloth, appears in summer. "Some Good Garden Plants," containing descriptions and notes of plants which have received the Award of Garden Merit, will be published in January.

Reports of the Society's Conferences (the latest being Rock Gardens and Rock Plants published in 1936) are also published from time to time, as well as numerous Pamphlets, Books and Lists. A full list can be obtained on application to the Secretary.

FELLOWS' TICKETS.

Fellows are particularly requested to observe the rules of the Society governing the use of personal passes and transferable tickets. The personal passes must only be used by the Fellows themselves; a transferable ticket must be retained by the person who has used it to pass him into the particular Show. All personal passes and transferable tickets must be produced to the Society's officers on demand.

ADMISSION TO MEETINGS WITHOUT TICKETS.

Any Fellow who attends the Society's Meetings at its Halls without producing his ticket will be asked to pay the entrance money and sign his name in a special book. The entrance money will be refunded to him on written application to the Secretary.

GARDENERS' TICKETS FOR THE GREAT SPRING SHOW AT CHELSEA.

Any gardener or employee in a private, public or botanic garden, nursery or seed establishment may obtain tickets at reduced prices for the Great Spring Show, admitting on the Thursday of the Show, on application direct to the Secretary, R.H.S., Vincent Square, Westminster, S.W. 1, not less than three days before the Show. All applications must be on the special forms which may be obtained from the Secretary.

KINDRED SOCIETIES' SHOWS.

The following Kindred Societies will hold Shows in the Society's Hall on the dates given in the Calendar, and Fellows' tickets will admit: Alpine Garden Society, British Carnation Society, Rhododendron Association, Iris Society, British Delphinium Society, Cactus and Succulent Society, National Carnation and Picotee Society, British Gladiolus Society, London Gardens Society, London Allotments and Gardens Show Society, National Rose Society (September Show), National Chrysanthemum Society (September Show) and

National Dahlia Society. The National Auricula and Primula Society and the London Viola and Pansy Society will stage their exhibits at the ordinary fortnightly meetings.

Form of Bequest.

I give and bequeath to the Treasurer for the time being of The Royal Horticultural Society, London, the sum of £ , to be paid out of such part of my personal estate as I can lawfully charge with the payment of such legacy, and to be paid free of legacy duty, within six months of my decease; the receipt of such Treasurer to be a sufficient discharge for the same. And I declare that the said legacy shall be applied towards [the general purposes of the Society].

Royal Horticultural Society's Halls.

When not in use by the Society, the Halls, Lecture Room and Committee Rooms may be hired at reasonable rates for any large gatherings, such as Exhibitions, Shows, Concerts, Bazaars, Meetings and Balls.

Copies of the regulations and terms for hiring the Halls and Rooms may be obtained on application to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1.

Information and Inquiries.

Fellows may obtain information and advice from the Society as to the names of flowers and fruits, on points of practice, attacks of insects and fungi, and on other questions. All inquiries should be sent direct to the Secretary, R.H.S. Offices, Vincent Square, S.W. 1.

How to Send Specimens for Identification.

When inquiring the name of a plant or a fruit Fellows would greatly facilitate identification of the specimen by observing the following rules:

1. Send a good strong piece, bearing leaves and at least three blossoms. Cut the flowers in the bud stage or they will be over before they arrive. It is rarely possible and never wise to name a plant from its leaf alone, and poor specimens with only one blossom make identification unnecessarily difficult.

2. Wrap in soft paper and then pack in moss or even damp grass. Do not use cotton-wool. Specimens should not be pressed.

3. Give all the information you can respecting the specimens, including the size of the plant and the country of origin or natural habitat, if known. With a garden plant, say where it is growing, greenhouse or open, sun or shade, etc.

4. Of fruits, send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens

representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how they are grown, *e.g.* indoors or out, as cordons, bushes or standards, etc.

5. It is a convenience if specimens are sent so as to reach the office on the day before a Show day, as it is then possible to enlist the services of the experts on the Committees.

Inspection of Gardens.

Inspection of gardens belonging to Fellows is conducted by a thoroughly competent Inspector from the Society, who reports and advises at the following cost, viz.: a fee of £3 3*s*. for one day (or £5 5*s*. for two consecutive days), together with all out-of-pocket expenses. No inspection may occupy more than two days, save by special arrangement. Should two or more Fellows residing in the same district, with their gardens within easy reach of one another, desire to have the services of the Garden Inspector, arrangements will be made for such a combined inspection and the fee and expenses divided by consent of those concerned. Fellows wishing for the services of an Inspector are requested to give at least a week's notice and choice of two or three days, and to indicate the most convenient railway station and its distance from their garden. Gardens can only be inspected at the *written* request of the *owner*.

Sale of Exhibits at Shows.

The attention of Fellows is drawn to the Society's rule that nothing may be sold for removal during a Show. Misunderstandings with regard to this rule sometimes occur, and its strict observance is essential for the smooth running of the meetings.

THE SOCIETY'S GARDENS.

Presented by the late Sir Thomas Hanbury, K.C.V.O.

WISLEY COMMITTEE

appointed under the Hanbury Trust Deed.

Trustees.	*R.H.S. Representatives.*
C. R. SCRASE-DICKINS, M.A., D.L., V.M.H.	PRESIDENT, *ex-officio.*
The MARQUESS OF HEADFORT.	TREASURER, *ex-officio.*
The EARL OF STAIR, D.S.O., J.P., D.L.	C. T. MUSGRAVE, V.M.H.

Trustees of the Wisley Gardens Endowment Fund.

THE PRESIDENT AND COUNCIL OF THE SOCIETY.

An important part of the work of the Society is carried out at its Gardens at Wisley. The Society has always maintained a garden for the practical side of its work: in its early days at Kensington, then at Ealing and Chiswick, and finally, in 1903, through the kindness of Sir THOMAS HANBURY, the present Gardens at Wisley, which were handed over to the Society in trust and which have since been considerably enlarged.

Director.

R. L. HARROW, V.M.H.

Keeper of the Laboratory.
M. A. H. TINCKER, M.A., D.Sc., F.L.S.

Mycology.
D. E. GREEN, M.Sc.

Entomology.
G. F. WILSON, F.L.S., F.R.E.S., N.D.H.

Botany.
N. K. GOULD.

Assistant for Trials.
F. C. BROWN.

Assistant for Fruit Experiments.
J. M. C. POTTER, N.D.H.

Chief Clerk.
W. D. CARTWRIGHT.

Keeper of the Gardens.
R. FINDLAY.

Superintendent of Floral Department.
W. J. BLAKEY.

Superintendent of Rock Garden Department.
J. T. WALL.

Foreman of Glass Department.

Artist.
A. J. WISE.

Caretaker and Engineer.
W. HOLMES.

Assistant to the Director.

B. O. MULLIGAN, N.D.H.

The whole of the work at Wisley is under the control of the President and Council of the Society, whose object is to develop the garden in such a way that it will meet all the requirements of horticulture and serve not only for the enjoyment and instruction of Fellows, but also for the advancement of horticultural science.

Trials of plants, fruits, vegetables, and sundries are held annually with the object of discovering the best of their several kinds and varieties. At the same time the varieties are described and classified.

The laboratory provides accommodation for the work of the members of the staff and for the instruction of student gardeners who receive training in both the science and practice of gardening.

A prospectus of the School of Horticulture may be had on application to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1; or to the Director, R.H.S. Gardens, Wisley, Ripley, Surrey.

Practical demonstrations of garden operations are held at suitable seasons: see Calendar of Shows and Fellows' Tickets.

Admission to the Gardens at Wisley.

The gates will be open on week-days, including Bank Holidays (but Good Friday and Christmas Day excepted), from 10 A.M. to sunset, or to 7.30 P.M. (whichever is the earlier), on Sundays from the first Sunday in April to the last Sunday in September from 2 to 6 P.M., and on Sundays in October from 2 to 5 P.M.

Fellows of the Society, on showing their tickets, have free personal admission to the Gardens on all occasions when the gates are open.

Friends of Fellows will be admitted on presenting a Fellow's Transferable Ticket, which will admit three persons in all.

The public are admitted on week-days on payment of 2*s.* 6*d.* for adults, and 1*s.* for children under the age of 15 years; admission on Sundays is reserved for Fellows and their Friends.

Children under the age of 15 years will not be admitted unless accompanied by an adult, who will be held responsible for their conduct while in the Gardens.

Members of affiliated Societies and of Horticultural and Scientific Institutions desirous of visiting the Gardens in parties will be afforded free admission on application to the Director of the Gardens by the responsible authority. Applications for such visits should be made at least 14 days in advance.

All other bodies desirous of visiting the Gardens in parties should apply to the Secretary of the Royal Horticultural Society, stating the number of the party and date of anticipated visit. Such parties will be required to pay 1*s.* a head, with a minimum of 10*s.*, and must purchase tickets in advance.

No dogs or perambulators will be admitted. Parcels, baskets, etc., must be left at the gate.

How to get to the Gardens.

The Gardens are situated at Wisley in Surrey, within a short distance of the main Portsmouth Road, about a mile on the London side of Ripley. They are distant about four miles from Byfleet and West Weybridge Stations, four from Effingham and Horsley, and five from Weybridge, all on the Southern Railway. Motors can always be hired from Mr. Howard at Byfleet Station (5*s.* each way), or from Messrs. Shanks, Weybridge (10*s.* each way).

Byfleet, West Weybridge, and Weybridge Stations are on the Southern Railway Main Line and are served by a convenient service of electric trains from Waterloo. There are connexions with Chertsey and Reading at Weybridge.

Effingham and Horsley Stations are also served by a frequent service of electric trains from Waterloo and Guildford.

Cheap day tickets are issued from Waterloo as under :

To	*Return Fares.*		*On*
	1st Class.	*3rd Class.*	
Effingham Junction .	4*s.* 3*d.*	2*s.* 9*d.*	Week-days and Sundays by all trains.
Horsley . . .	4*s.* 6*d.*	3*s.* 0*d.*	
Weybridge . .	3*s.* 9*d.*	2*s.* 6*d.*	
West Weybridge .	4*s.* 3*d.*	2*s.* 9*d.*	
Byfleet . . .	4*s.* 6*d.*	3*s.* 0*d.*	

Available for return by any train on the day of issue.

An hourly service (half-hourly on Sundays in the summer) of omnibuses—Service No. 215 (Mondays to Friday), and No. 20 (Saturday and Sunday)—runs along the Portsmouth Road between Kingston Omnibus Station, near Kingston Railway Station, and North Street, Guildford, and passes within 5 minutes' walk of the Gardens ; and other local services within about a mile.

Service Nos. 20 and 215 provide connexions with other services as under :

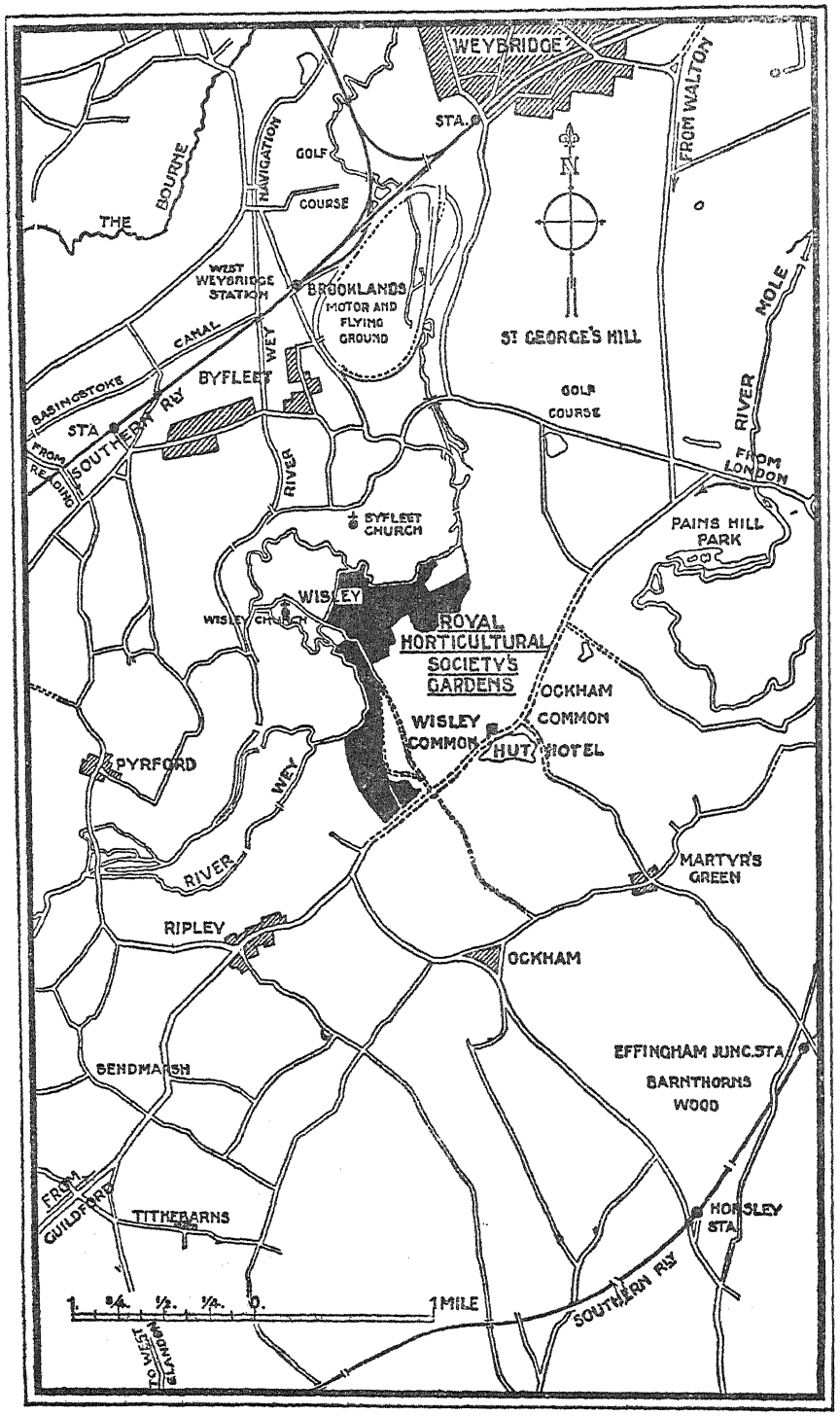
At Cobham (*White Lion*) with Service No. 462 for Stoke D'Abernon, Leatherhead, Weybridge, Addlestone, Chertsey, Staines, Wraysbury, and Slough.

At Esher (*Bear Hotel*) with Service No. 217 for Hersham and Walton-on-Thames ; and Service No. 218 for Lower Halliford, Shepperton and Laleham.

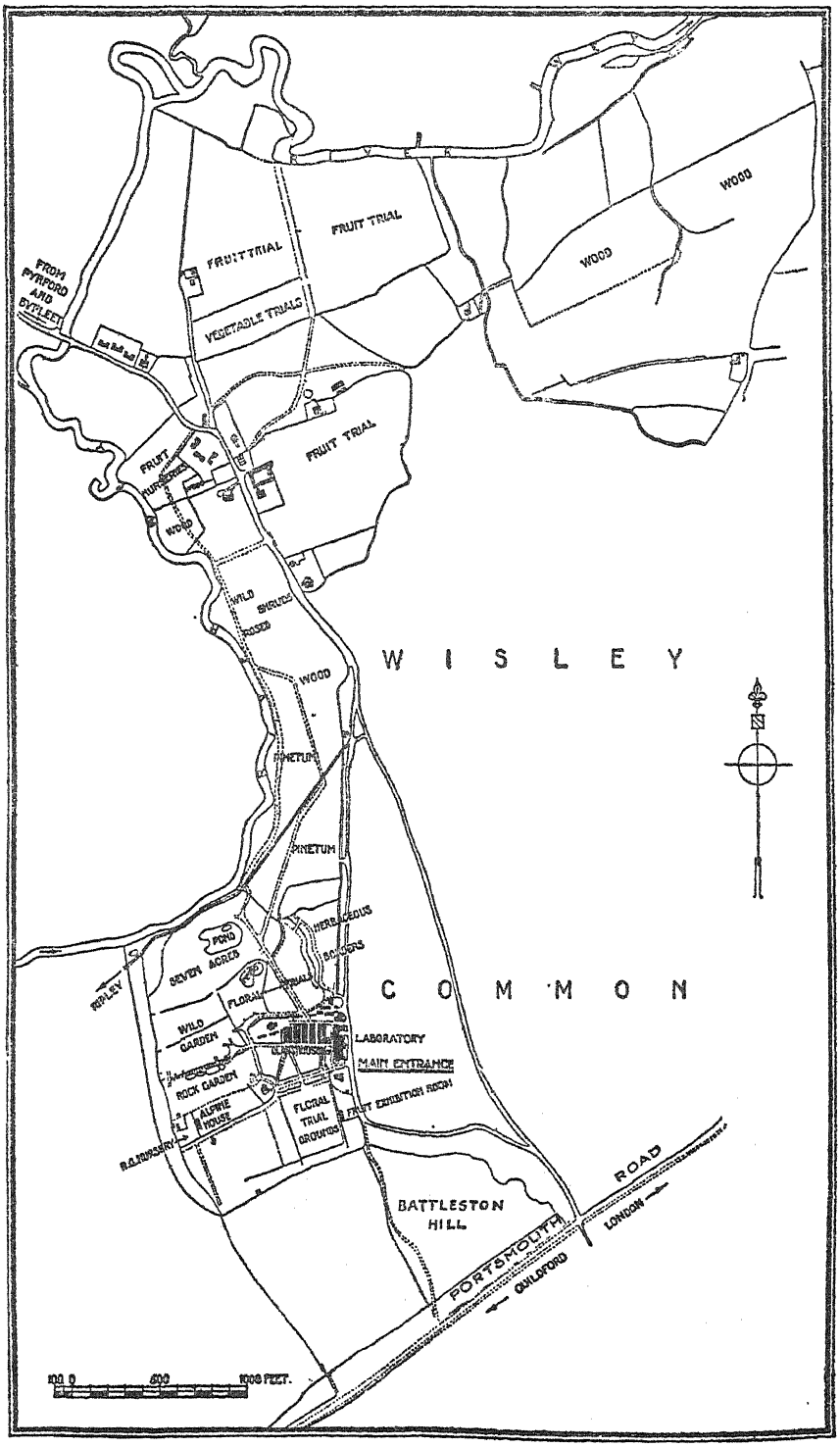
At Kingston Omnibus Station with Service Nos. 14 (Saturdays and Sundays in summer only) and 85 for Roehampton and Putney Bridge Station (District Line), with Service No. 65 for Petersham, Richmond, Brentford, and Ealing, and with Service No. 406 for Tolworth, Epsom, Tadworth, Kingswood and Reigate.

At Ripley with Service No. 436 for Woking, Byfleet, Chertsey, Egham and Windsor.

From Guildford omnibuses run to all parts of Surrey.



WISLEY GARDENS.—ROUTE MAP.



PLAN OF THE SOCIETY'S GARDENS WISLEY

The "Green Line" also runs a half-hourly coach service (every 20 minutes at week-ends) between Guildford and Hertford, via Marble Arch. The coaches stop by request at the R.H.S. Gardens turning on the Portsmouth Road (5 minutes' walk).

For times, the London Passenger Transport Board's Time-tables should be consulted.

As mentioned above, trials of Fruit, Vegetables and Flowers are being continuously carried out, and these are based on a regular Calendar. The rules governing these trials at Wisley may be had on application to the Secretary, R.H.S. Offices, Vincent Square, S.W. 1, or to the Director, R.H.S. Gardens, Wisley, Ripley, Surrey, to whom all articles for trial should be addressed. The Trials arranged for 1938–9 are as follows:

INVITED TRIALS, 1938–9.

TO BE JUDGED IN 1938.

VEGETABLES.

Sweet Corn (Early varieties only)	1 packet of each variety to be sent by January 31.
Late Peas, maturing after 'Alderman'	½ pint " " " " "

FLOWERS.

New Dahlias	3 plants of each variety to be sent by April 30.
New Delphiniums and Belladonna varieties	3 " " " " " March 31.
New Gladioli	6 corms " " " " "
Chrysanthemums (Early Flowering)	6 cuttings (unrooted) of each variety to be sent by February 5.
China Asters, Ostrich Plume and Giant Comet	1 packet of each variety to be sent by January 31.
Godetias (Dwarf varieties)	1 " " " " " "
Dimorphothecas	1 " " " " " "
Lobelia cardinalis	3 plants " " " " March 31.

PREPARATION FOR TRIALS IN 1939.

To prepare for the trials given in the Biennial Calendar, some of the seeds and plants are required sufficiently in advance to become established by the time appointed for their consideration by the Judges, namely:

To be sent in 1938.	For Judging in 1939.	
		Cauliflowers, 1 oz. of each variety to be sent by July 30, 1938.
		Stocks (Brompton and East Lothian). 1 packet of each variety to be sent by April 30, 1938.

CALENDAR OF R.H.S. "INVITED TRIALS."

	1938.*	1939.*
Flowers	New Dahlias New Delphiniums New Gladioli	New Dahlias New Delphiniums New Gladioli

* See above for quantities to be sent, and dates when they are required. Senders are urgently asked to consult the list which asks for certain plants, etc.' to be sent a year or two in advance of that in which they will be judged.

CALENDAR OF R.H.S. "INVITED TRIALS"—*continued.*

	1938.*	1939.*
Flowers .	New Irises New Sweet Peas New Border Carnations China Asters, Ostrich Plume and Giant Comet Chrysanthemums, Early Flowering Godetias, Dwarf varieties Dimorphothecas Delphinium, "Belladonna" varieties Stocks, Brompton and East Lothian Lobelia cardinalis	New Irises New Sweet Peas New Border Carnations China Asters, Late varieties Viola cornuta, types and hybrids from seed Ursinias Statice, Annual
Vegetables	Sweet Corn (Early varieties) Late Peas (maturing after 'Alderman') Broccoli (January–March varieties; now growing at Wisley) Cauliflowers, Autumn Sown	Brussels Sprouts Runner Beans Radishes (other than winter varieties) Parsnips

The Gardens themselves now cover nearly 228 acres, further land of about 28 acres consisting of a piece of property known as Battleston Hill and the adjoining field fronting on the Portsmouth Road having been acquired. The Gardens are laid out on the general lines shown on the plan on p. 25.

A section of the work at the Gardens of national importance is the trials of all kinds of hardy fruit for commercial planting. These trials are conducted under a Joint Committee of the Ministry of Agriculture and Fisheries and the Royal Horticultural Society (see p. 55). They commenced in 1922, and many useful results are being obtained. Reports of the trials are published from time to time in the Society's JOURNAL.

DISTRIBUTION OF SURPLUS PLANTS.†

Every year in March surplus plants and seeds are distributed to those Fellows who apply for them. Of many varieties the stock is limited, and the application forms are therefore collected, and from time to time are thrown into ballots and then drawn at random. The demands of each list are then satisfied as far as the available stock permits, and those Fellows who are disappointed by not receiving the plants for which they ask, must remember that there is no other method of treating all alike.

Fellows are asked to remember that the plants will necessarily be small and need careful handling when received. It is obvious that owing to their numbers the plants distributed could not be kept in the Gardens and grown on until they had reached a large size.

* See above for quantities to be sent, and dates when they are required. Senders are urgently asked to consult the list which asks for certain plants, etc., to be sent a year or two in advance of that in which they will be judged.

† These are plants which are surplus to the requirements of the Wisley Gardens, and as the Gardens become fully planted the number available may be diminished.

All application forms should be returned before the end of February, and no application can be entertained which is received after the end of April.

The Society does not pay the cost of packing and carriage. The parcels must be sent by post, the postage being prepaid by the Fellows themselves. Directions as to the amount of remittance to be sent for this purpose will be found on the application forms for plants, and Fellows are requested to follow out carefully all the directions there printed.

Fellows residing beyond a radius of thirty-five miles from London are permitted to choose double the number of plants to which they would otherwise be entitled. Fellows residing abroad, subscribing one guinea per annum, are allowed twenty packets of seeds, and higher rates of subscriptions in proportion.

Fellows residing outside the United Kingdom and Ireland may apply for seeds on the list on the form provided, but plants cannot be sent to them owing either to difficulty of transport or to Government restrictions. Endeavour will, however, be made to procure for them to a reasonable extent any rare or unusual seeds which they cannot procure in the country where they live.

No plants will be sent to Fellows whose subscriptions are in arrear, or who do not fill up their forms properly.

EXAMINATIONS IN HORTICULTURE.

The Society conducts several examinations in horticulture, and the regulations and syllabus for any of them can be obtained by writing to the Secretary, R.H.S. Offices, Vincent Square, Westminster, S.W. 1.

The dates * for these examinations are given in the Calendar.

National Diploma in Horticulture.

Written Examinations: Preliminary, Final.
Practical Examinations: Preliminary, Final.

This is the highest examination in horticulture conducted by the Society, and was established in 1912, with the sanction of the Board of Agriculture, as a test of real professional ability.

Among those for whose benefit the Diploma was established are the following: Florists, Fruit Growers, Gardeners, Horticultural Inspectors, Horticultural Instructors,† Landscape Gardeners, Market Gardeners, Nurserymen, Public-Park Gardeners and Seedsmen.

* These dates are subject to alteration.

† This does not include a School Master or Mistress who is engaged in teaching other subjects in schools, but applies only to persons whose chief work in life is devoted to giving instruction in horticulture. The examination is for the horticultural profession only.

The examination is designed to test, first, a candidate's practical knowledge and, secondly, his acquaintance with the principles underlying garden practice. The examiners will do their best to discourage "cramming," and to insist on practical experience. Books are valuable only when used intelligently to supplement experience.

Teachers' Examinations in School and Cottage Gardening.

Preliminary Examination: Written.
Advanced Examination: Written and Practical.

This examination is not exclusively confined to members of the scholastic profession, but is open to all persons who can furnish a satisfactory certificate of having done practical work. Candidates in both the preliminary and advanced examinations must satisfy the examiners that they have had practical gardening experience.

General Examination.

General Examination for Seniors (18 years of age and over).
General Examination for Juniors (under 18 years).

This examination is held by the Royal Horticultural Society to assist the efforts of County Councils, Technical Institutes, Schools, Gardeners' Mutual Improvement Societies and other bodies to promote instruction in practical horticulture, and in the hope of rendering such instruction definite and effective.

National Certificate in Elementary Horticultural Practice.

An examination in horticulture for students in Farm Institutes has been established, open only to students who have taken at least one year's course in horticultural work and in the principles underlying horticultural practice in an approved institution. Alternative syllabuses have been prepared, and the examination consists of both written and practical parts. Particulars of this examination may be had at the Institutions concerned.

British Floral Art Diploma.

This examination was established in 1933 with the object of encouraging and stimulating interest in this craft by the establishment of a Diploma.

The examination is open to both men and women; the date of the 1937 examination is given in the Calendar.

There is no age limit, but the number of candidates accepted for each examination will be limited.

There are both practical and written examinations, and Diplomas will be awarded to successful candidates.

The examination is intended primarily for florists and florists' assistants, but is not confined to members of the florists' trade.

AWARDS AND MEDALS.

The following awards are made by the Council :—

CERTIFICATES.

The awards given to plants, flowers, fruits and vegetables are :—

1. FIRST CLASS CERTIFICATE.—Instituted 1859. Given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to plants, flowers, fruits and vegetables of great excellence.

2. AWARD OF MERIT.—Instituted 1888. Given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to plants, flowers, fruits and vegetables which show a sufficiently distinct advance on their predecessors.

3. PRELIMINARY COMMENDATION.—Instituted 1931. Given at Shows on the recommendation of the Floral, Orchid, Narcissus and Tulip, and the Joint Committees; the award for a new plant of promise whether a new introduction from abroad or of garden origin.

4. HIGHLY COMMENDED.

5. COMMENDED.

These two Awards are given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to noteworthy plants, flowers, fruits and vegetables after trial at Wisley or elsewhere.

6. BOTANICAL CERTIFICATE.—Instituted 1878. Given on the recommendation of the Scientific Committee to plants of botanical interest.

7. AWARD OF GARDEN MERIT.—Instituted 1921. Given on the recommendation of the Wisley Advisory Committee to plants which either are well known to the Council, Committees and Garden Staff, or have been tested and grown at Wisley in the same manner as they would have been grown in a private garden, and have proved to be excellent for ordinary or greenhouse use.

A plant that has received this award is not thereby precluded from receiving other awards.

The following awards are given to individuals :—

8. CERTIFICATE OF APPRECIATION.—Instituted 1908. Given on the recommendation of the Scientific Committee to persons whose work is of scientific interest from a horticultural point of view, or is such as may be reasonably expected to assist in the improvement of a strain or in creating a new break.

9. CERTIFICATE OF CULTURAL COMMENDATION.—Instituted 1872. Given on the recommendation of the Fruit and Vegetable, Floral, Orchid, Narcissus and Tulip, and the Joint Committees to growers whose exhibits show evidence of great cultural skill.

The following awards are given to Sundries after trial on the recommendation of the Wisley Advisory Committee :—

(*a*) AWARD OF MERIT.

(*b*) HIGHLY COMMENDED.

(*c*) COMMENDED.

MEDALS.

1. THE LAWRENCE MEDAL.—Instituted in 1906 to celebrate Sir Trevor Lawrence's twenty-one years' tenure of office as President of the Society. Awarded directly by the Council annually for the best exhibit shown to the Society during the year. No exhibitor may receive this gold medal more than once in three years.

2. THE GOLD MEDAL.—Instituted in 1898. Re-designed in 1929. Awarded for exhibits of special excellence.

3. THE FLORA MEDAL.—Instituted in 1836. Awarded for exhibits of flowers and ornamental plants. Struck in bronze, silver and silver-gilt.

4. THE BANKSIAN MEDAL.—Instituted in 1820 in commemoration of Sir Joseph Banks, P.R.S., one of the founders of the Society. Awarded for exhibits of flowers and ornamental plants. Struck in bronze, silver and silver-gilt.

5. THE HOGG MEDAL.—Instituted in 1898 in commemoration of Dr. Robert Hogg, the great pomologist, sometime Secretary of the Society. Awarded for exhibits of fruit. Struck in bronze, silver and silver-gilt.

6. THE KNIGHTIAN MEDAL.—Instituted in 1836 in honour of Thomas Andrew Knight, F.R.S., President of the Society, 1811 to 1838. Awarded for exhibits of vegetables. Struck in bronze, silver and silver-gilt.

7. THE LINDLEY MEDAL.—Instituted in 1866 in commemoration of Dr. John Lindley, F.R.S., sometime Secretary of the Society. Awarded for exhibits of a plant or plants of special interest or beauty or showing exceptional skill in cultivation, and for educational exhibits. Struck in bronze, silver and silver-gilt.

8. THE GRENFELL MEDAL.—Instituted in 1919 in commemoration of Field-Marshal Lord Grenfell, President of the Society, 1913 to 1919. Awarded for exhibits of pictures, photographs or objects of a similar nature of horticultural or botanical interest. Struck in bronze, silver and silver-gilt.

9. THE WILLIAMS MEMORIAL MEDAL.—Instituted in 1896 by the Trustees of the Williams Memorial Fund in commemoration of B. S. Williams. Re-designed in 1927. Awarded directly by the Council for a group of plants and/or cut blooms of one genus which show excellence in cultivation. Fruit and vegetables are excepted. Two medals in gold are annually available for award.

10. THE P. D. WILLIAMS MEDAL.—Instituted in 1936, the fund being subscribed to commemorate the late P. D. Williams, V.M.H. Awarded for Daffodils and Rhododendrons. In 1938 three medals are offered for award in a class at the Daffodil Show on April 12 and 13 (see special schedule), and one in gold to the exhibitor of the best Rhododendron to which an Award has been given when shown before the Society during the year. Struck in gold, silver-gilt, silver and bronze.

11. THE SANDER MEDAL.—Instituted in 1923 and presented by the firm of Messrs. Sander & Sons in memory of H. F. C. Sander, F.L.S., V.M.H., the founder of the firm. Awarded to the exhibitor of the best new greenhouse plant of general utility shown to the Society during the year. Struck in gold.

12. THE GEORGE MOORE MEDAL.—Instituted in 1926 and presented by the late G. F. Moore, V.M.H. Awarded to the exhibitor of the best new Cypripedium shown to the Society during the year. Struck in gold.

13. THE HOLFORD MEDAL.—Presented by the Executors of the late Sir George Holford in 1928. Awarded for the best exhibit of plants and/or flowers (fruit and vegetables excluded) shown by an amateur during the year in the Society's Halls. Struck in gold.

14. THE SEWELL MEDAL.—Instituted in 1929 and presented by the late A. J. Sewell. Awarded for exhibits of plants suitable for the rock garden or alpine house. Struck in gold. In 1938 five medals are offered for award, two on April 5, two on May 10 and one on June 8. One medal is offered on each date for an amateur's exhibit; on the first and the last dates one medal is also offered for a horticultural trader's exhibit. Each amateur's exhibit must consist of three, and each horticultural trader's of six, pots or pans not exceeding 12 inches in diameter if circular, or 112 sq. inches in internal area if rectangular. Only one subject may be shown in each pot or pan. It is not necessary that the plants should have been grown in the receptacles in which they are shown and, if desired, plants may be lifted and potted for the purposes of the competition. Not fewer than two-thirds of the plants in each exhibit must be in bloom, and plants which are not in bloom should possess decorative value when shown. The scale of points for judging will be as follows: Suitability, 24 points; Rarity, 18 points; Cultivation, 24 points. Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than by the first post on the Wednesday preceding the show.

15. THE VEITCH MEMORIAL MEDAL.—Instituted in 1870 in commemoration of James Veitch of Chelsea. In 1922 the Veitch Memorial Trust was vested in the Council of the Society. Awards of medals and prizes are made annually to those who have helped the advancement of the science and practice of horticulture, and for special exhibits. Struck in bronze, silver and gold.

Any medal awarded at one of the Society's Meetings is awarded to the exhibitor and for a particular exhibit. The Award may not be advertised by any one other than the exhibitor, and the exhibitor may only advertise the Award by using the terms of the Award card, i.e. by quoting the words " for an exhibit of Begonias," or " for an exhibit of Delphiniums," or as the case may be.

The Council, having ascertained that the majority of firms who exhibit at the Society's Meetings do not desire to possess many medals of the same grade, has decided that the first time a horticultural trader is awarded a medal it will be forwarded, but no medal of the same grade will be sent afterwards unless application is made within a year from the date of the award. Medals will never be sent out unengraved.

CUPS.

CHALLENGE CUPS.

The following cups are offered for award at the Society's Meetings. A challenge cup, unless otherwise stated, will be held for one year by the winner, who will be required to give a guarantee for its return in good condition. The winner will receive a certificate recording his success and, except where a replica of the cup is supplied, his gardener will receive an appropriate silver Hogg, Knightian or Banksian Medal. The decision of the Council is final and any cup may be withheld at its discretion.

1. THE AFFILIATED SOCIETIES' CUP.—Founded in 1908 by the Society and offered for the best collection of fruit shown by an Affiliated Society in the special class at the Fruit and Vegetable Show on October 11, 1938. For conditions see special schedule.

2. THE CAIN CUP.—Presented by Sir Charles Nall-Cain, Bt. (Lord Brocket) in 1920. Offered for the best exhibit shown by an amateur at the Great Spring Show at Chelsea. Applications for space should be made on the form in the schedule.

3. THE CLAY CHALLENGE CUP.—Presented by Messrs. Clay in 1913. Offered to the raiser of a rose of good form and colour, not in commerce before the current year, and possessing the true old rose scent, such as may be found in the old Cabbage or Provence Rose, in ' General Jacqueminot,' ' Marie Baumann,' ' Duke of Wellington,' ' General McArthur,' etc. The scent known as " tea rose " is not, for the purposes of this competition, to be counted the true old rose scent. Not more than three different varieties may be shown by one competitor. At least three and not more than six blooms or trusses of each variety will be required, together with a plant in flower and bud. The cup will be awarded only once for the same rose. Open for competition to trade and amateur growers at the Fortnightly Show on July 19, 1938. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

4. THE CORONATION CUP.—Founded in 1911. Usually offered for the best exhibit at the Great Autumn Show. As there is no Autumn Show in 1938 it is not offered this year.

5. THE ENGLEHEART CUP.—Founded in 1913 by the Society and offered at the annual Daffodil Show for one stem of each of twelve varieties raised by the exhibitor. See special schedule.

6. THE FOREMARKE CHALLENGE CUP.—Presented by Sir Francis Burdett, Bt., in 1919. Offered for twenty spikes of named Gladioli in not less than ten varieties and not more than two spikes of any one variety. Open for competition to trade and amateur growers at the Fortnightly Show on August 9, 1938. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

7. THE GEORGE MONRO MEMORIAL CUP.—Presented in 1921 by Mr. George Monro and his brothers in memory of their father. Offered for the best exhibit of grapes shown by an amateur at the Fruit and Vegetable Show on October 11, 1938. The conditions of the competition will be found in the special schedule.

8. THE GORDON-LENNOX CUP.—Presented by Lady Algernon Gordon-Lennox in 1913. Offered for the most meritorious exhibit of fruit shown by an amateur at the Fruit and Vegetable Show on October 11, 1938. Conditions will be found in the schedule. The winner's gardener will receive a replica of the cup presented by Lady Algernon Gordon-Lennox.

9. THE ORCHID CHALLENGE CUPS.—Presented by the Orchid Trade. An exhibitor winning one of these cups three times retains it in perpetuity.

(*a*) A CHALLENGE CUP for the best group of orchids exhibited at the Great Spring Show, Chelsea, in a space not exceeding 45 square feet by an amateur who employs not more than three assistants in the orchid houses, including the head gardener. Applications for space should be made on the form in the schedule.

(*b*) A CHALLENGE CUP for the best group of orchids exhibited at the Fortnightly Show on October 25, 1938, in a space not exceeding 60 square feet, by an amateur who employs not more than three assistants in the orchid houses, including the head gardener. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

10. THE R.H.S. VEGETABLE CHALLENGE CUP.—Founded in 1910. Offered at the Fruit and Vegetable Show on October 11, 1938, to the competitor who secures the greatest number of first-prize points for exhibits of vegetables.

11. THE SHERWOOD CUP.—Presented in 1920 by the members of the Sherwood family in memory of N. N. Sherwood. Offered for award by the Council directly for the most meritorious exhibit of the Great Spring Show at Chelsea. Applications for space should be made on the form in the schedule.

12. THE WIGAN CUP.—Presented by Mr. A. L. Wigan in 1911, usually offered for the best exhibit of roses shown at the Great Autumn Show. As there is no Great Autumn Show in 1938 it is not offered this year.

CUPS AND TROPHIES TO BE WON OUTRIGHT.

13. THE REGINALD CORY MEMORIAL CUP.—This cup is given with the view of encouraging the production of hardy hybrids of garden origin, and will be awarded only to the raiser of a plant that is the result of an intentional cross. Only a hybrid of which one parent is a true species is eligible, and it must have been exhibited at one of the Society's Shows and received an Award during the current year. Hybrids of annuals and biennials do not come under the scope of the award.

14. A CUP FOR A CYMBIDIUM.—A Silver Cup, presented by the Hon. Henry Tufton, is offered for award at the Fortnightly Show on March 22, 1938, for the best Cymbidium, old or new. The competition is open to both amateurs and horticultural traders. Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than the first post on the Wednesday preceding the Show.

15. THE CYMBIDIUM TROPHY.—A Silver trophy, presented by the Orchid Trade, is offered for award at the Fortnightly Show on March 22, 1938, for an exhibit of 12 Cymbidium plants (species and/or hybrids) staged by an amateur. Entry forms may be had on application to the Secretary and must be returned not later than by the first post on Wednesday, March 16, 1938.

16. THE CYPRIPEDIUM TROPHY.—A silver trophy, presented by the Orchid Trade, is offered for award at the Fortnightly Show on January 11, 1938, for an exhibit of 25 Cypripedium plants (species and/or hybrids) staged by an amateur. Entry forms may be had on application to the Secretary, and must be returned not later than by the first post on Wednesday, January 5, 1938.

17. A SILVER CUP FOR DAFFODILS.—A silver cup, presented by Messrs. Barr & Sons, Ltd., is offered for award at the Daffodil Show, April 12 and 13, 1938, to the competitor who obtains the highest total number of prize-points in the single-bloom classes for amateurs. (See special schedule.)

18. THE ODONTOGLOSSUM TROPHY.—A silver trophy, presented by the Orchid Trade, is offered for award at the Fortnightly Show on April 26, 1938, for an exhibit of 25 Odontoglossum plants (species and/or hybrids, including Odontiodas, etc.) staged by an amateur. Entry forms may be had on application to the Secretary, and must be returned not later than by the first post on Wednesday, April 20, 1938.

19. ORCHID TROPHIES, presented by the Orchid Trade for competition at the Fortnightly Show on October 25, 1938.

(*a*) A Silver Trophy for the best twelve orchids, not more than two of any one genus, exhibited by an amateur who employs not more than two growers, including the head gardener, in his orchid houses.

(*b*) A Silver Trophy for the best six orchids exhibited by an amateur who employs not more than one orchid grower or gardener.

Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

20. THE RIDDELL TROPHY FOR VEGETABLES.—A silver trophy is provided each year from a fund established in 1931 by Lord Riddell for the encouragement of the cultivation and exhibition of vegetables. In 1938 the trophy is offered for award in the class for a table of vegetables at the Fruit and Vegetable Show, October 11, 1938. (See special schedule.)

21. THE SUTTON VEGETABLE CUPS.—Messrs. Sutton & Sons, Ltd., present annually two cups for vegetables.

One is offered for award for the best group of vegetables shown by an amateur at the Great Spring Show at Chelsea. (See special schedule.)

The other is offered for the best exhibit of twelve distinct kinds shown by an amateur in the special class at the Fruit and Vegetable Show. (See special schedule.)

22. A SILVER TROPHY FOR CACTI AND SUCCULENTS.—A silver trophy provided from Mrs. Sherman Hoyt's Prize Fund is offered for the best group of cacti and/or succulents staged by an amateur at the Fortnightly Show on September 13, 1938. Entries must be received not later than by the first post on the Wednesday preceding the Show, on special forms obtainable from the Secretary.

THE JONES-BATEMAN CUP.

Presented by Miss L. Jones-Bateman of Cae Glas, Abergele, in 1920, for the encouragement of fruit production. Offered triennially for original research which has added to our knowledge of cultivation, genetics, or other matters relating to fruit growing. The cup is held by the winner for three years, and on being relinquished the holder receives a Hogg medal in gold. Particulars of competition may be obtained on application to the Secretary. The Cup will be available for competition in 1940.

THE LODER RHODODENDRON CUP.

Presented in 1921 by Mr. G. W. E. Loder (Lord Wakehurst) in memory of his brother, Sir Edmund Loder, Bt. The cup will be awarded annually, but not more than once in seven years to the same individual. In awarding it the judges will consider, not merely floral display, but the value to horticulture of the work of the recipient, whether such work shall include the production of flowers or not. Of the five judges, three will be appointed by the Royal Horticultural Society and two by the Rhododendron Society. The award will be made in November of each year. The cup is held by the winner for one year.

PETER BARR MEMORIAL CUP.

Presented in 1912 by the Trustees of the Peter Barr Memorial Fund in commemoration of Peter Barr, V.M.H. Awarded every year on the recommendation of the Narcissus Committee to someone who in the Committee's opinion has done good work of some kind in connexion with daffodils. The cup is held by the winner for one year.

EXHIBITIONS: GENERAL NOTES.*

SHOWS have been arranged for the dates given in the Calendar, but the Council reserves the right to alter the list in any way that may from time to time seem to be in the interest of the Society. All persons, whether Fellows of the Society or not, unless excluded by some special regulation, are invited to exhibit. Schedules containing special regulations are issued for the Daffodil Show, the Early Market Produce Show, the Great Spring Show, and the Fruit and Vegetable Show.

Those who desire to exhibit at a Fortnightly Meeting at the Halls must give notice in writing to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1, not later than by the first post on the Wednesday before the Meeting at which they wish to exhibit, stating the nature of the proposed exhibit and how much space it will occupy. Entry forms may be obtained from the Secretary, and exhibitors are requested to use them. Letters will be sent to exhibitors on the Wednesday before the Meeting saying what space has been allotted. If no letter is received by the Friday before the Meeting the exhibitor should at once communicate with the Secretary. There are no entry fees, nor are there any charges for space or staging for exhibits of plants, flowers, fruit, vegetables, pictures, plans, or models. A charge is made for space for exhibits of horticultural sundries at the Great Spring Show at Chelsea, but not at the Society's Halls. The Council reserves to itself the right to refuse any application for space, and, in the event of any such refusal, it is not to be required to give any reason or explanation. The allotment of space, both as regards area and position, will be in accordance with the discretion of the Council, and exhibitors must be content to abide loyally by its decision.

Fellows are specially invited to exhibit interesting or well-grown plants, flowers, fruits or vegetables, and any Fellow who desires to stage an exhibit of not more than three pots, vases, or dishes may do so at any Fortnightly Meeting, although he has not applied for space beforehand. Such exhibits must be entered with the clerk at the Small Exhibits Table by noon on the morning of the Meeting, and he will provide exhibitors' cards and stage the exhibits. Exhibitors are not permitted to place on this special table any notices or leaflets, nor may any orders be booked there. Exhibits staged under this regulation may be considered for Certificates of Cultural Commendation.

The Society's officers will, if necessary, unpack and stage small exhibits if the Secretary has been notified beforehand of their coming

* A copy of the complete regulations for exhibitions may be obtained on application to the Secretary.

and of the owner's inability to accompany them, but in no case can the Society undertake or be responsible for their repacking or return. All parcels sent by rail or post must be sent carriage paid and at the risk of the sender, addressed to the Secretary, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1. A separate notification must be sent by post at the same time.

Exhibitors may, generally, begin staging at 2 P.M. on the day before a Fortnightly Meeting and continue until 10 P.M., when the lights will be turned out and the Hall closed. After 10 P.M. no goods can be admitted until the next morning. Staging may be resumed at 6.30 A.M. on the day of the Meeting. Exhibits intended for the Narcissus and Tulip Committee's inspection must be ready by 10.30 A.M. and most other exhibits by 11.30 A.M. At special Shows exhibits must be ready for inspection by the time given in the particular schedule. Vases, 6 inches and 9 inches in height, are provided by the Society. Exhibitors are at liberty to borrow them in return for a deposit of *2s. 6d.* a dozen which is refunded when the vases are returned in good order at the end of the Meeting. White plates, 10 inches in diameter, may be borrowed from the Society by exhibitors free of charge.

Every exhibit must be entered with the Secretary of one or other of the Committees (see pp. 42–54), viz.: the Fruit and Vegetable, the Floral (which deals with flowers, foliage plants, trees and shrubs), the Orchid, the Narcissus and Tulip, the Picture, or the Scientific Committee. Exhibits intended for one Committee may not be mixed with those intended for another. Fruits and vegetables may not be combined in one exhibit, and flowers may not be mixed with either, but foliage, such as that of asparagus or small ferns, may be placed between the dishes. Tomatos rank as vegetables. Decorative vegetables, such as coloured kales, must be shown as vegetables, and not mixed with flowers unless permitted by special regulations for a particular Show or Competition. Table decorations, bouquets, wreaths and sprays of flowers are excluded unless specifically invited. Plants and produce exhibited to show the effect of different manures and soils are considered to be sundries and may only be exhibited as such. Mushroom spawn may be shown, but only among the sundries. No artificial, dyed or surface-coloured plants, flowers, foliage, fruit or vegetables may be exhibited. No dormant bulbs or corms, and no plants ordinarily grown for their flowers or fruits, but not in flower or fruit, can be admitted to the Society's Meetings, unless specially permitted by the regulations or as horticultural sundries. Miniature gardens in which the container is of more importance than the plants may only be shown as sundries.

Pictures and photographs of plants, flowers, and gardens, and plans and models of gardens, may be exhibited at the Society's Fortnightly Shows during November, December, January and February. Only works which are definitely of horticultural or botanical interest are invited. Paintings of flowers should be at least life-size; miniatures are unsuitable for the Society's exhibitions. Pictures executed in needlework or modelled in paper, and all fanciful or fancy-work objects.

pictures, calendars, Christmas cards and similar objects are also unsuitable and may not be shown. No awards will be made at Fortnightly Shows for exhibits of plans, or photographs or models of gardens. Sundries may be shown in the Halls during December and January. As in 1938 there is only one Show in December, sundries will be admitted on November 29, if space permits. Sundries may also be exhibited at the Great Spring Show at Chelsea. Only sundries of a distinctly horticultural nature may be shown. Raffia in the form of dolls or other fancy figures, pot-pourri, scent, ladies' smocks, or embroidered or other fancy aprons are not regarded as horticultural.

Only actual exhibitors, and such assistants as may be necessary for the arrangement of the exhibits, will be admitted before the exhibition is opened to the public. All persons, except such as may be retained by the Society, must retire at the time fixed for judging. Exhibitors' passes will be issued when necessary. Photographs may be taken at the Society's exhibitions only by those holding photography-permits issued by the Secretary. Smoking is strictly prohibited in the Halls during the hours of the exhibitions.

After judging has taken place, nothing exhibited may be altered or removed until the close of the Show, except by permission of the Secretary. This does not apply to faded flowers, which should be replaced. Nothing exhibited may be removed from the Meetings until after the time of closing without special permission in writing. Exhibitors are forbidden to sell plants, flowers, fruit, vegetables or other articles for removal during the Meeting. The door-keepers have instructions to see that this rule is observed. In order not to deter the owners of new or special plants from submitting them to the Committees for award, the Council has decided that written application may be made to the Secretary for leave to remove such plants at 5 P.M. on the first day of any two-day Meeting at the Society's Hall. The Council hopes that sparing use will be made of this privilege, and that application will be made only in cases of urgent necessity. Nothing may be removed from an exhibit under this regulation until the written application has been signed by the Secretary. All goods must be removed from the Halls by 9 o'clock on the evening the Show closes, unless special arrangements have been made with the Secretary. Anything left on the premises remains there at the owner's sole risk.

All exhibits, personal property, etc., shall be at the risk of the exhibitors, and the Society shall not be liable for compensation for loss or damage by theft, fire, water, accident, the requirements of the London County Council, or any other cause whatsoever. Should a Show from any cause not be held, no exhibitor shall have any claim on the Society or its officers for loss, damage, interest, or compensation. Exhibitors will be wholly responsible for any claim made by their employees under the Employers' Liability Acts or the Workmen's Compensation Act, etc. The Society has no responsibility to any but its own employees.

THE COMMITTEES AND THEIR WORK.

COMMITTEES are appointed annually to meet in connexion with the Society's Shows and other activities. Some are nominated entirely by the Council, while others are appointed jointly by the Council and the governing bodies of allied societies. One of the principal objects of these Committees is to encourage the introduction of new species of plants and the production of new and improved varieties of decorative plants, flowers, fruits and vegetables, by examining and reporting upon such as may be submitted either at exhibitions or for trial. Awards are made by the Council to meritorious objects upon the recommendations of these Committees. Another function of the Committees is to collect and disseminate information about plants, flowers, fruits, vegetables and other objects of horticultural interest, including information regarding the classification and nomenclature of garden plants, and the incidence and control of diseases and pests. Certain Committees report upon the merits of non-competitive exhibits staged in the Exhibition Halls at Fortnightly Shows, and awards made by the Council are based largely on the Committees' recommendations.

In connexion with the submission of new plants to the Committees for certificate or for selection for trial, each plant must be entered with the Secretary of the appropriate Committee, who will say where the plant should be placed. Forms for this purpose may be obtained from the Society's Office before the Committee Meetings, or from the Secretaries of the Committees on the mornings of the Committee Meetings. All plants submitted to the Committees should be named as a means of future identification. If the exhibitor believes that the plant has a name, although it is unknown to him, the words " Name unknown " should be written on the entry form in the place provided for the name, and the Committee will then endeavour to identify the plant. If the plant is of garden origin, it should be named by its owner or raiser before it is submitted to the Committee. The names must conform to the Rules of Nomenclature adopted at the Ninth International Horticultural Congress held in London in 1930 (see p. 40). No award will be made to anything without a name. If the naming is in doubt, the award may be made subject to the verification of the name, and if the proposed name does not conform to the Rules of Nomenclature, any award made will be subject to the alteration of the name. Exhibitors are particularly requested to supply the information required by the entry form, and also any additional particulars which they may think interesting for publication. They will also greatly facilitate the work of the Committees by sending specimens of well-known varieties for comparison.

In considering a new plant it is laid down—(*a*) that no recommendation for an Award to a plant shall be made to the Council unless at least six members vote for it; (*b*) that no recommendation for a First Class Certificate shall be made unless the number of votes cast in favour of it is at least three times the number cast against it; (*c*) that no recommendation for any other Award shall be made unless the number of votes cast in favour of it is at least double the number recorded against it; and (*d*) that while the merits of an exhibit shown by a member of the Committee, or in which any member of the Committee is professionally interested, are under discussion, the member concerned must withdraw and not take part in the voting.

Specimens of plants that have received Awards or that have been selected for trial will be placed on the New-Plant Stand in the Hall. Exhibitors entering new plants before the Committees must understand before doing so that if the variety is selected for trial, they tacitly agree to send the number of plants or seeds of it required for trial the following year, and that if any Award is made, they give their consent to the object being painted or photographed for the Society.

THE NAMING OF PLANTS.

NAMES are given to plants so that when they are spoken or written about there may be no confusion as to the particular plant referred to. Every plant must therefore bear one name only, which must be universally accepted.

At the International Horticultural Conferences of London in 1930, Paris in 1932, and Rome in 1935, the nomenclature of garden plants was fully discussed and general agreement was reached on most matters that relate to the naming of garden plants.

The principles governing the naming of plants by botanists were accepted as the basis for the naming of plants of garden origin, these principles being:—

1. A plant can bear but one valid name.
2. The valid name is the earliest which conforms to the accepted Rules of Nomenclature.

Names of species and botanical varieties are framed according to the Rules of Botanical Nomenclature agreed at the Botanical Congress of Vienna in 1905 and revised at the Congresses of Brussels in 1910, Cambridge in 1930, and Amsterdam in 1935.

Briefly, the botanical name of a species consists of two words of Latin form. The first is that of the genus to which the plant belongs, written with an initial capital letter; the second, the earliest specific name given by Linnæus in 1753 or by botanists subsequently, so long as it conforms with the rules, written usually with a small initial letter (e.g. *Berberis aggregata*). A capital initial letter is, however, given where specific names are derived from names of persons (but not places) (e.g. *Berberis Wilsonae, Campanula Allionii*) or are those of old genera (e.g. *Crataegus Oxyacantha, Ranunculus Flammula*). The Paris Conference recommends that for horticultural purposes all specific names should be written with a small initial letter.* The gender of the specific name is the same as that of the genus (e.g. *Ranunculus parnassifolius, Primula japonica, Arum maculatum*, but most trees are regarded as feminine, so *Quercus sessiliflora* and *Fagus sylvatica* are correct).

For a full discussion of these botanical names the "Rules" should be consulted.

In order to obtain uniformity in the use of generic names, a list of the genera which are sometimes divided by botanists has been drawn up and recommendations are made as to the name to be retained in horticulture. These names are chosen in conformity with the Rules and apply only where differences of treatment are given by botanists. At the Horticultural Congress in Rome in 1935 a list of specific names of plants of horticultural interest was agreed for international use for the ensuing six years and, in addition, certain lists of names of garden varieties were also adopted as standards for future use.

Names of botanical varieties follow the name of the species to which they belong. Thus, *e.g.*, the botanical varieties of *Narcissus triandrus* would be *Narcissus triandrus* var. *albus, N. triandrus* var. *calathinus, N. triandrus* var. *concolor*, and so on. These varietal names follow the same rules as specific names.

Names of species and botanical varieties are thus fully provided for.

Plants raised in gardens as seedlings or sports of these species or as hybrids between species often have to be named by non-botanical people, and the following rules, agreed to at the International Horticultural Conferences of London and Paris, are for their guidance. They are based on the principles and rules which have been briefly outlined.

(*a*) The name of a horticultural variety should be placed after that of the species to which it belongs, and its status should, or may, be indicated by the contraction "var." Examples are given below.

(*b*) The varietal name should be of Latin form only when it expresses some character of the plant, e.g. *nanus, fastigiatus, albus*, or its place of origin, e.g. *kewensis*.

The use of Latin proper names for horticultural varieties is not permissible, e.g. *Iris pallida Smithii* would be an inadmissible name for a garden variety.

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* This recommendation follows the practice of zoologists in naming animals. For the present the Society thinks it better to follow the recommendation in the "Rules of Botanical Nomenclature" in its own publications.

(*c*) The name will thus usually be a " fancy " name, beginning with a capital letter, e.g. *Galega officinalis* var. ' George Hartland,' not *Galega officinalis* var. *Hartlandii* ; *Dianthus deltoides* var. ' Brilliant,' not *Dianthus deltoides* var. *brilliantissimus* ; Pea ' Masterpiece.'

(*d*) Varietal names must not be translated when transferred from other languages, but must be preserved in the language in which they were originally described. Where desirable a translation may be placed in brackets after the varietal name.

(*e*) As far as possible names of horticultural varieties should consist of a single word ; the employment of not more than three words is permitted as a maximum.

(1) A varietal name in use for one variety of a kind of plant should not be used again for another variety of that kind, even though it may be attached to a different species.

That is, the use of the name *Narcissus Pseudonarcissus* ' Victoria,' should preclude the use of ' Victoria ' as a varietal name for any other species of Narcissus, such as *Narcissus poeticus* ' Victoria.' Similarly, there should be but one Iris ' Bridesmaid,' one Plum ' Superb ' and so on.

(2) Varietal names likely to be confused with one another should be avoided. For instance, the use of the name 'Alexander ' should preclude the use of 'Alexandra,' 'Alexandria,' and 'Alexandrina ' as varietal names for the same kind of plant.

(3) Where personal names are used to designate varieties, the prefixes " Mr.," " Mrs.," " Miss," and their equivalents should be avoided.

(4) Excessively long words and words difficult to pronounce should be avoided in coining varietal names.

(5) The articles " a " and " the " and their equivalents should be avoided in all languages when they do not form an integral part of a substantive, *e.g.* ' Colonel,' not ' The Colonel ' ; ' Giant,' not ' The Giant ' ; ' Bride,' not ' The Bride.'

(6) Existing names in common use should not be altered to conform to these rules, but attention should be paid to them in all new names proposed.

(*f*) The names of horticultural hybrids are formed in the same way as those of horticultural varieties (see paras. *a–e*).

[Hybrids are indicated by the multiplication sign × placed before the name of the hybrid.]

(*g*) The " genus " of bigeneric hybrids (*i.e.* hybrids between species of two different genera) is designated by a formula showing the parent genera in alphabetical order, and where necessary by a name compounded of the names of both genera, e.g. *Laeliocattleya, Urceocharis, Chionoscilla.*

(*h*) The " genus " of multigeneric hybrids (*i.e.* hybrids between species of three or more genera) is also designated by a formula and/or a conventional name, preferably that of a distinguished person to which is added the termination " *ara,*" e.g. *Potinara, Vuylstekeara.* The names of trigeneric hybrids already in use, e.g. *Brassolaeliocattleya,* should be retained. All hybrids in which the same genera are combined receive the same generic name, no matter how they are combined, *e.g.* the same generic name would apply to all combinations of the genera *Brassavola, Cattleya, Epidendrum* and *Laelia.*

(*i*) All plants raised by crossing the same two species of plants receive the same specific name, variations between the seedlings being indicated where necessary by varietal names framed as already described. In practice in cross-bred plants, the specific name is frequently omitted, *e.g.* Iris 'Ambassadeur.'

(*k*) In order to be valid, a name must be published.

(*l*) The publication of a name of a horticultural variety or hybrid is effected by a recognizable description, with or without a figure, in any language written in Roman characters.

(*m*) The description must appear in a recognized horticultural or botanical periodical, or in a monograph or other scientific publication, or in a dated horticultural catalogue.

(*n*) The mention of a variety without description in a catalogue, or in the report of an exhibition, is not valid publication, even if the figure is given. It is desirable that descriptions of new varieties in horticultural catalogues should also be published in periodical horticultural papers.

SCIENTIFIC COMMITTEE, 1938.

The Scientific Committee reports upon diseases, pests, newly imported plants, first hybrids between species, curious plants, inventions and such other objects of horticultural interest and value as may be brought before it by Fellows and by other Committees of the Society, deals with the determination of doubtful plants and their correct nomenclature, and considers proposals and makes recommendations for Botanical Certificates and Certificates of Appreciation. Fellows are therefore strongly urged to send specimens, with explanatory notes, of any new plants, of attacks of insects or fungi, or of other similar troubles on which they would like to obtain the opinion of the Committee. As full reports as possible will be published in the Society's JOURNAL and forwarded to the senders. All communications should be addressed to "The Secretary of the Scientific Committee, Royal Horticultural Society, Vincent Square, Westminster, S.W. 1," and must reach the Society's offices not later than 2 P.M. on the day of the Meeting.

In considering the recommendation of the Botanical Certificate, regard is paid to (*a*) the special botanical interest of the plant exhibited; and (*b*) the desirability of encouraging the introduction and exhibition of novelties, even though they may not be of immediate commercial value, nor of a specially decorative character. Peculiarity of morphological or anatomical construction, physiological endowments, or adaptation to varying conditions; novelty, whether of introduction or of cultural origin; geographical distribution; potential value for garden or economic uses are all matters to be taken into account.

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VICE-CHAIRMEN.

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BEWLEY, W. F., C.B.E., D.Sc., Experimental and Research Station, Cheshunt, Herts.
BLACKMAN, Prof. V. H., M.A., Sc.D., F.R.S., Imperial College of Science, S.W. 7.
BLAIR, K. G., Sc.D., F.R.E.S., British Museum (Natural History), Cromwell Road, S.W. 7.
CRANE, M. B., A.L.S., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.
FARMER, Sir JOHN B., LL.D., D.Sc., F.R.S., V.M.H., St. Leonards, Weston Road, Bath.
FRYER, J. C. F., O.B.E., M.A., F.R.E.S., Plant Pathological Laboratory, Milton Road, Harpenden, Herts.
GROVE, A., F.L.S., V.M.H., Branstone Lodge, Kew Road, Kew, Surrey.
HALL, Sir DANIEL, K.C.B., LL.D., D.Sc., F.R.S., V.M.H., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.

HANBURY, F. J., F.L.S., F.R.E.S., V.M.H., Brockhurst, East Grinstead, Sussex.
HILL, Sir ARTHUR W., K.C.M.G., M.A., Sc.D., F.R.S., F.L.S., V.M.H., Royal Botanic Gardens, Kew, Surrey.
HOOPER, CECIL H., F.L.S., F.S.I., Oxenturn, Wye, Kent.
HURST, C. C., Sc.D., Ph.D., F.L.S., D.L., J.P., 50 Knighton Drive, Leicester.
JACKSON, A. BRUCE, A.L.S., 3 The Avenue, Kew Gardens, Surrey.
KEEBLE, Sir FREDERICK, C.B.E., M.A., Sc.D., F.R.S., F.L.S., Cedron House, Fowey, Cornwall.
MARSDEN-JONES, E. M., F.L.S., The Potterne Biological Station, Devizes, Wilts.
ODELL, J. W., 116 Welldon Crescent, Harrow, Middlesex.
PERCIVAL, Prof. J., M.A., Sc.D., F.L.S., Leighton, Shinfield, Reading, Berks.
PRAIN, Lieut.-Col. Sir DAVID, C.M.G., C.I.E., LL.D., F.R.S., F.L.S., V.M.H., The Well Farm, Warlingham, Surrey.
PRESTON, F. G., University Botanic Garden, Cambridge.
RAMSBOTTOM, J., O.B.E., M.A., F.L.S., British Museum (Natural History), Cromwell Road, S.W. 7.
ROBINSON, G. W., Chelsea Physic Garden, S.W. 3.
RUSSELL, Sir E. JOHN, D.Sc., F.R.S., Rothamsted Experimental Station, Harpenden, Herts.
SALISBURY, Dr. E. J., F.R.S., University College, Gower Street, W.C. 1.
SALMON, Prof. E. S., F.L.S., South-Eastern Agricultural College, Wye, Ashford, Kent.
SMITH, Sir WILLIAM WRIGHT, M.A., F.R.S.E., F.L.S., V.M.H., Royal Botanic Garden, Edinburgh, 4.
WEISS, Prof. F. E., D.Sc., LL.D., F.R.S., F.L.S., Easedale, Woodway, Merrow, near Guildford, Surrey.
WILSON, GURNEY, F.L.S., c/o R.H.S. Offices.
WORSDELL, W. C., 11 Westbourne House, Twickenham, Middlesex.
WORSLEY, A., J.P., The Cliff, 3 Bath Road, Ventnor, I. of W.

NOTE.—Members of the Council are Members of this Committee, and Chairmen of Standing and Joint Committees are *ex-officio* members.

The Committee will meet at 4 P.M. on the first day of all Fortnightly Meetings.

* * *

FRUIT AND VEGETABLE COMMITTEE, 1938.

CHAIRMAN.

BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.

VICE-CHAIRMEN.

NIX, C. G. A., V.M.H., Tilgate, Crawley, Sussex.
SECRETT, F. A., F.L.S., V.M.H., Bell Farm, Felcot Road, Hersham, Walton-on-Thames, Surrey.

POTTER, J. M. S., R.H.S. Gardens, Wisley. (*Secretary.*)

BARNETT, H. T., Westwood House, Tilehurst, Reading, Berks.
BASHAM, JOSEPH, Fairoak Nurseries, Bassaleg, near Newport, Mon.
BOSTOCK, F., D.L., Pitsford House, Northampton.
BULLOCK, A., 158 Northwood Way, Northwood Hills, Middlesex.
CRANE, M. B., A.L.S., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.
DIVERS, W. H., V.M.H., Westdean, Hook, near Surbiton, Surrey.
EARL, W. J., Knowsley Gardens, Prescot, Lancs.
FALCONER, A., Secretary's Office, Stamford Park, Stalybridge, Cheshire.
GILES, W. F., Furzebank, 38 Redlands Road, Reading, Berks.
HALL, H. J., The Gardens, Harewood, near Leeds.
HALL, R. H., The Gardens, Hatfield House, Hatfield, Herts.
HOLLOWAY, W. H., The Gardens, Tewin Water, Welwyn, Herts.
JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.
KELF, GEO., 140 Ivy Road, Cricklewood, N.W. 2.
LAXTON, E. A. L., V.M.H., 63 High Street, Bedford.
LOBJOIT, Sir WILLIAM G., O.B.E., J.P., V.M.H., Oakdene, Wooburn, High Wycombe, Bucks.
MARKHAM, H., Wrotham Park Gardens, Barnet, Herts.
METCALFE, A. W., Rozel, Hatfield Road, St. Albans, Herts.
MIDDLETON, C. H., 17 Prince's Avenue, Surbiton, Surrey.

MODRAL, W. C., The Gardens, Old Warden Park, Biggleswade, Beds.
NEAL, E., The Gardens, Tilgate, Crawley, Sussex.
NEAME, THOMAS, The Offices, Macknade, Faversham, Kent.
PRINCE, H., 119 St. Peter's Road, Earley, Reading, Berks.
RAWES, A. N., c/o T. Rivers & Son, Ltd., The Nurseries, Sawbridgeworth, Herts.
RICHARDS, J. M., The Gardens, Gatton Park, Reigate, Surrey.
SMITH, A. C., The Green Farm, Shillington, near Hitchin, Herts.
STREETER, F., The Gardens, Petworth Park, Sussex.
TAYLOR, H. V., O.B.E., D.Sc., V.M.H., Ministry of Agriculture and Fisheries, S.W. 1.
TOMALIN, T. E., The Gardens, Stansted Park, Rowlands Castle, Hants.
TUCKETT, P. DEBELL, 17 Durham Villas, Kensington, W. 8.
WESTON, J. G., The Gardens, Chatsworth, Bakewell, Derbyshire.
WILSON, JAMES, The Gardens, Trent Park, New Barnet, Herts.
WOODWARD, J. G., Teston, Maidstone, Kent.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 12 NOON on the first day of all Fortnightly Meetings, and at the Early Produce Show, Tuesday, April 12; and at 10.30 A.M. on Tuesday, May 24, at Chelsea.

Entries at Chelsea Show must be handed in by 10 A.M. on Tuesday, May 24 ; at other meetings by 11.30 A.M.

All fruits for certificates must be ripe or in such a condition that their quality may be estimated. To permit a correct description being drawn up, a sufficient sample must be sent for tasting, together with leaves (if available), and a small branch to show the growth. Of apples, pears, peaches, nectarines, apricots, and plums—not fewer than nine must be sent ; of damsons and bullaces—thirty fruits ; of cherries and raspberries—fifty fruits ; of strawberries—twenty fruits ; of gooseberries—thirty fruits ; of red and white currants—thirty bunches ; of black currants—one pound ; of nuts—one pound ; of tomatos—two plants in fruit. Details of the origin and chief characteristics of the variety, together with the age of the tree, must be given on the entry form. In the case of peaches and nectarines, the size of the flowers must be stated.

A First Class Certificate can only be awarded to a variety which has received an Award of Merit, and when its growth and cropping habits are known to several Members of the Committee. If necessary, the Chairman will appoint a Committee of three to inspect and report upon the growing tree. Promising varieties of hardy fruits are recommended for the trials for commercial purposes at Wisley.

Awards are not made to the following plants until their cropping qualities and distinctive merits have been ascertained by trial at Wisley :—Beans, Brassicas, Cucumbers, Melons, Peas, Potatos, Tomatos, and similar fruits and vegetables. Awards are not recommended in London to plants which can be, and usually are, raised each year from seed and brought to maturity within a year from the sowing of the seed. Nor are awards recommended independently in London to plants which are usually perpetuated by seed if the class to which they belong is under trial at Wisley, has been tried in the previous year, or is on the Trials Calendar for the ensuing year. Awards to plants commonly grown from seed each year are given to the strain and not to the individual plants.

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FLORAL COMMITTEE A, 1938.

Floral Committee A deals with Florists' Flowers and Plants, except Orchids, Narcissi and Tulips, Dahlias, Delphiniums, Irises, Perpetual-Flowering and Border Carnations and Picotees, Sweet Peas. For these see the Special or Joint Committees.

CHAIRMAN.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.

VICE-CHAIRMEN.

CRANE, D. B., 50 Cholmeley Crescent, Cholmeley Park, Highgate, N. 6.
INGAMELLS, D., 27 Catherine Street, Covent Garden, W.C. 2.
OLDHAM, W. R., J.P., V.M.H., Chimney Close, Windlesham, Surrey.

CARTWRIGHT, W. D., R.H.S. Gardens, Wisley. (*Secretary.*)

ALLAN, D., c/o Dobbie's Seed Farms, Marks Tey, Essex.
ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.
ARMSTRONG, W. F., Supt. Office, Gunnersbury Park, Acton, W. 3.
CAMPBELL, D., New Lodge, Inner Circle, Regent's Park, N.W. 1.
CHURCHER, Major GEO., Beckworth, Lindfield, Haywards Heath, Sussex.
DARLINGTON, H. R., M.A., F.L.S., Park House, Potters Bar, Middlesex.
DAWKINS, A., c/o Alfred Dawkins (Chelsea), Ltd., 408 King's Road, Chelsea, S.W. 10.
DICKSON, HUGH, c/o T. Cullen & Sons, Witham, Essex.
ENGELMANN, C., Saffron Walden, Essex.
HAY, R. E., New Lodge, Hyde Park, W. 2.
JANES, E. R., 12 Brooklyn Drive, Emmer Green, Reading, Berks.
LANGDON, C. F., V.M.H., Twerton Hill Nursery, Bath, Somerset.
PAGE, COURTNEY, 117 Victoria Street, S.W. 1.
RIDING, JAS. B., The Nurseries, Chingford, E. 4.
SIMMONS, D. W., The Nurseries, Harlesden Road, St. Albans, Herts.
SMITH, Mrs. LINDSAY, Postford House, Chilworth, Surrey.
STEVENSON, T., Colham Green Nurseries, Hillingdon, Middlesex.
STEWART, W., Royal Hospital, Chelsea, S.W. 3.
TRACEY, Mrs. I. A., High Hall, Wimborne, Dorset.
TRESEDER, F. G., The Nurseries, Cardiff.
WELLS, BEN, Hardy Plant Nurseries, Merstham, Surrey.
WEST, J. T., Tower Hill, Brentwood, Essex.
WIGHTMAN, Lady, The Garden House, Bengeo, Hertford, Herts.
WILKIN, H. T., c/o Carters Tested Seeds, Ltd., Raynes Park, S.W. 20.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet:

at 12.15 P.M. on the first day of all Fortnightly Meetings, and at Chelsea on Tuesday, May 24.

Entries must be handed in to the Secretary of the Committee by 10.15 A.M. at Chelsea, and by 11.45 A.M. on all other occasions when the Committee meets.

The number of specimens required varies according to the heading under which an award is sought; for an award as a show flower, at least three open blooms, either cut or on a plant or plants, must be shown; for an award as a variety for cutting or for market, at least sufficient cut flowers to fill a vase, and in the case of a rose or chrysanthemum, a plant in bloom; for an award as an ornamental pot-plant, at least three plants in pots, one of which, in the case of a chrysanthemum, must be shown without any disbudding while the other two should be somewhat disbudded; for an award as a bedding plant, one plant will usually be sufficient; and for an award as a variety for the herbaceous border in all practicable cases at least one growing plant will be required, but cut specimens, if sufficient, will be admissible when the habit of the plant is well known.

The following florists' flowers and plants are given awards (except Preliminary Commendation) only after trial at Wisley:—Anemone (Japanese), Aster (Michaelmas Daisy), Aubrietia, Alpine Auricula, Chrysanthemum (early flowering, for garden decoration), Cistus, Clematis, Dianthus (Pinks), Fuchsia, Gladiolus (for cutting or garden decoration), Helianthemum, Hemerocallis, Kniphofia, Lupinus (perennial), Phlox (herbaceous and alpine), Primrose, Pyrethrum, Veronica (herbaceous), Viola. When any of these plants are submitted to the Committee in London, and considered worthy, they are selected for trial at Wisley.

No award, except Preliminary Commendation, is recommended in London to plants which can be, and usually are, raised each year from seed and flowered within a year from the sowing of the seed; and no award, except Preliminary Commendation, is recommended independently in London to plants which are usually perpetuated by seed if the class to which they belong is under trial at Wisley, has been tried in the previous year, or is on the Trials Calendar for the ensuing year. All plants which receive Preliminary Commendations under this regulation are selected for trial at Wisley. Awards to plants commonly grown from seed each year are given to the strain and not to individual plants.

FLORAL COMMITTEE B, 1938.

Floral Committee B deals with Plants other than Florists' Flowers and Plants, except Orchids other than hardy terrestrial kinds, Narcissi and Tulips, Dahlias, Delphiniums, Irises, Rhododendrons, Rock-garden and Alpine-house Plants. For these see Special or Joint Committees.

CHAIRMAN.

MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.

VICE-CHAIRMEN.

ABERCONWAY, Lord, C.B.E., V.M.H., 38 South Street, Mayfair, W. 1.
BEAN, W. J., C.V.O., I.S.O., V.M.H., 2 Mortlake Road, Kew, Surrey.
BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Bulls Cross, Enfield, Middlesex.

GOULD, N. K., R.H.S. Gardens, Wisley. (*Secretary.*)

BAKER, G. P., V.M.H., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.
BAKER, W. G., The Botanic Garden, Oxford.
BALFOUR, A. P., c/o Sutton & Sons, Ltd., Seed Trial Grounds, Slough, Bucks.
BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.
BYNG OF VIMY, The Viscountess, Thorpe Hall, Thorpe-le-Soken, Essex.
CAMPBELL, W. M., Royal Botanic Gardens, 197 Kew Road, Kew, Surrey.
CLARKE, Col. STEPHENSON R., C.B., J.P., LL.D., V.M.H., Borde Hill, Haywards Heath, Sussex.
COMBER, J., V.M.H., The Gardens, Nymans, Handcross, Sussex.
COUTTS, J., V.M.H., Lasswade, Green Meads, Westfield, Woking, Surrey.
CRANFIELD, W. B., F.L.S., V.M.H., East Lodge, Enfield Chase, Middlesex.
ELLIOTT, CLARENCE, Six Hills Nursery, Stevenage, Herts.
FARDEN, R. S., Ridgehurst, Ridgeway, Sutton, Surrey.
FENWICK, MARK, J.P., V.M.H., Abbotswood, Stow-on-the-Wold, Glos.
HAMILTON, The Marquess of, 22 Cambridge Square, W. 2.
HARTINGTON, The Marquess of, M.P., Churchdale Hall, near Bakewell, Derbyshire.
HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.
INGWERSEN, W. E. TH., Birch Farm Hardy Plant Nursery, Gravetye, East Grinstead, Sussex.
JENKINSON, Capt. R. C. H., Knap Hill Manor, near Woking, Surrey.
LAWRENCE, Lady, Riverdale, Dorking, Surrey.
MARSDEN-JONES, E. M., F.L.S., The Potterne Biological Station, Devizes, Wilts.
NOTCUTT, R. C., Woodbridge, Suffolk.
OLDHAM, W. R., J.P., V.M.H., Chimney Close, Windlesham, Surrey.
PALMER, The Hon. LEWIS, 14 Buckingham Palace Gardens, S.W. 1.
PERRY, AMOS, V.M.H., Hardy Plant Farm, Enfield, Middlesex.
PRESTON, F. G., University Botanic Garden, Cambridge.
REUTHE, G., Sunnycroft, 109 Crown Lane, Bromley, Kent.
ROSSE, The Earl of, Birr Castle, King's Co., Ireland.
RUSSELL, L. R., V.M.H., Richmond Nurseries, Windlesham, Surrey.
STANLEY, Lady BEATRIX, C.B.E., C.I., Sibbertoft Manor, Market Harborough, Leicestershire.
STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.
STOKER, Dr. FRED, F.L.S., V.M.H., The Summit, Golding's Hill, Loughton, Essex.
STRATHCONA AND MOUNT ROYAL, Lord, 14 South Audley Street, W. 1.
WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.
WILDING, E. H., Wexham Place, Stoke Poges, Bucks.
WILLIAMS, C., M.P., 59 Tufton Street, Westminster, S.W. 1.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet:

at 12 NOON on the first day of all Fortnightly Meetings; and at 12.15 P.M. on Tuesday, May 24, at Chelsea.

Entries must be handed to the Secretary of the Committee by 10.15 A.M. at Chelsea and by 11.30 A.M. on all other occasions when the Committee meets.

The number of specimens required varies according to the heading under which an award is sought: for an award as a plant for bedding, at least one plant must be shown; for an award as a plant for the herbaceous border or as a plant for the water garden, a growing plant is required wherever practicable, but cut specimens, if sufficient, are admissible when the habit of the plant is well known; for an award as a plant for cutting, at least sufficient cut material to fill a vase must be shown.

No award, except Preliminary Commendation, is recommended in London to plants which can be, and usually are, raised each year from seed and flowered within a year from the sowing of the seed ; and no award, except Preliminary Commendation, is recommended independently in London to plants which are usually perpetuated by seed if the class to which they belong is under trial at Wisley, has been tried in the previous year, or is on the Trials Calendar for the ensuing year. All plants which receive Preliminary Commendations under this regulation will be selected for trial at Wisley. Awards to plants commonly grown from seed each year are given to the strain and not to individual plants.

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ORCHID COMMITTEE, 1938.

The Orchid Committee deals with all Orchids, except hardy terrestrial species, for which see Floral Committee B.

CHAIRMAN.

COLMAN, Sir JEREMIAH, Bt., M.A., D.L., J.P., V.M.H., Gatton Park, Reigate, Surrey.

VICE-CHAIRMEN.

CLARKE, Col. STEPHENSON R., C.B., J.P., LL.D., V.M.H., Borde Hill, Haywards Heath, Sussex.
HANBURY, F. J., F.L.S., F.R.E.S., V.M.H., Brockhurst, East Grinstead, Sussex.
ROTHSCHILD, LIONEL DE, O.B.E., V.M.H., 18 Kensington Palace Gardens, W. 8.

WILSON, GURNEY, F.L.S., c/o R.H.S. Offices. (*Hon. Secretary.*)

ALEXANDER, H. G., V.M.H., Woodlands, Westonbirt, Tetbury, Glos.
ARMSTRONG, T., Orchidhurst, Sandhurst Park, Tunbridge Wells, Kent.
ASHTON, E. R., Broadlands, Camden Park, Tunbridge Wells, Kent.
CONGREVE, AMBROSE, Moncorvo House, Ennismore Gardens, S.W. 7.
COOKE, Sir WILLIAM, Bt., Wyld Court, Hampstead, Norris, Newbury, Bucks.
COOKSON, CLIVE, Crescent House, Newcastle-upon-Tyne, 1.
CURTIS, C. H., F.L.S., V.M.H., 24 Boston Road, Brentford, Middlesex.
ELLWOOD, A. G., c/o Charlesworth & Co., Ltd., Haywards Heath, Sussex.
FARMER, R. E., Orchid Dept., Dell Park, Englefield Green, Surrey.
FLORY, SIDNEY W., Orchid Nursery, Slough, Bucks.
HATCHER, W. H., Cragg Wood Nurseries, Rawdon, Leeds, Yorks.
HOLMES, Mrs. MARGOT A., 56 Avenue Road, Regent's Park, N.W. 8.
HURST, C. C., Sc.D., Ph.D., F.L.S., D.L., J.P., 50 Knighton Drive, Leicester.
JAMES, The Hon. ROBERT, St. Nicholas, Richmond, Yorks.
LAWSON, HENRY P., Lynbrook, Knaphill, Woking, Surrey.
LOW, STUART H., Bush Hill Park, Enfield, Middlesex.
MCBEAN, A. A., Cooksbridge, Sussex.
MOORE, Dr. F. CRAVEN, Duckyls, near East Grinstead, Sussex.
MOORE, Sir FREDERICK W., M.A., F.L.S., V.M.H., Willbrook House, Rathfarnham, co. Dublin.
SANDER, FREDERICK K., The Camp, St. Albans, Herts.
SUMMERHAYES, V. S., B.Sc., The Royal Botanic Gardens, Kew, Surrey.
TUFTON, The Hon. HENRY S., Castle Hill, Englefield Green, Surrey.
WILSON, E. K., Cannizaro, Wimbledon, S.W. 19.

NOTE.—Members of the Council are Members of this Committee.

The Committee will meet :

at 11.45 A.M. on the first day of all Fortnightly Meetings ; and at 12.15 P.M. on Tuesday, May 24, at Chelsea.

Entries at the Chelsea Show must be handed to the Secretary of the Committee by 10.15 A.M. and on all other days when the Committee meets by 10.30 A.M.

Usually a growing plant is required, but when the plant would have to be sent from abroad, or from such a great distance that its transport would be an unreasonable burden for the exhibitor, the Committee may regard a cut spike as sufficient.

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NARCISSUS AND TULIP COMMITTEE, 1938.

CHAIRMAN.

BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Bulls Cross, Enfield, Middlesex.

VICE-CHAIRMEN.

CRANFIELD, W. B., F.L.S., V.M.H., East Lodge, Enfield Chase, Middlesex.
LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.
MONRO, GEORGE, C.B.E., V.M.H., 4 Tavistock Street, Covent Garden, W.C. 2.

SIMMONDS, A., R.H.S. Offices. (*Secretary.*)

ARKWRIGHT, Sir JOHN S., D.L., J.P., Kinsham Court, Presteign, Radnorshire.
BARR, HERBERT R., c/o Barr & Sons, 11/13 King Street, Covent Garden, W.C. 2.
BERKELEY, R. G., Spetchley Park, Worcester.
BRODIE OF BRODIE, Mrs., O.B.E., Brodie Castle, Forres, N.B.
COBLEY, R. SEYMOUR, 4 Bridgeland Street, Bideford, N. Devon.
COPELAND, W. F. M., West View, 156 St. James Road, Southampton.
COWEN, A., c/o J. R. Pearson & Sons, Ltd., Lowdham, Notts.
CURTIS, C. H., F.L.S., V.M.H., 24 Boston Road, Brentford, Middlesex.
DARNLEY, The Earl of, Cobham Hall, Cobham, Kent.
FARROW, A. E., Holbeach St. Marks, Holbeach, Lincs.
FITZHERBERT, Sir WILLIAM, Bt., Tissington Hall, Ashbourne, Derbyshire.
HALL, Sir DANIEL, K.C.B., LL.D., D.Sc., F.R.S., V.M.H., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.
HAWKER, Capt. H. G., M.A., Strode, Ermington, S. Devon.
JOHNSTONE, G. H., Trewithen, Grampound Road, Cornwall.
MEYER, Rev. Canon ROLLO, The Manor House, Little Gaddesden, Berkhamsted, Herts.
RENDLESHAM, Lord, Bosloe, Mawnan, Falmouth, Cornwall.
RICHARDSON, J. LIONEL, Prospect House, Waterford, Ireland.
SECRETT, F. A., F.L.S., V.M.H., Bell Farm, Felcott Road, Hersham, Walton-on-Thames, Surrey.
SLINGER, W., c/o Donard Nursery Co., Newcastle, co. Down, Ireland.
SMITH, H., Marken, 398 Wake Green Road, Moseley, Birmingham.
STANLEY, Lady BEATRIX, C.B.E., C.I., Sibbertoft Manor, Market Harborough, Leics.
STERN, Major, F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.
TITCHMARSH, C. C., N.D.H., Barrow, Englishcombe, Bath, Somerset.
WHITE, A. W., c/o J. T. White & Sons, Ltd., Daffodil Nurseries, Spalding, Lincs.
WILLIAMS, A. M., Werrington Park, Launceston, Cornwall.
WILLIAMS, M. P., Lanarth, St. Keverne, R.S.O., Cornwall.
WILSON, GUY L., The Knockan, Broughshane, co. Antrim, Ireland.

NOTE.—Members of the Council are members of this Committee.

The Committee will meet:

at 11 A.M. on the first day of all Fortnightly Meetings during February, March, April, and May; at 12 NOON at the Daffodil Show on Tuesday, April 12; and at 11.15 A.M. on Tuesday, May 24, at Chelsea.

Entries must be handed in to the Secretary of the Narcissus and Tulip Committee by 11 A.M. at the Daffodil Show; by 10.15 A.M. at the Chelsea Show; and by 10.30 A.M. on other occasions when the Committee meets.

The number of specimens required varies according to the award sought. For a Preliminary Commendation as a show daffodil, one stem is sufficient, but for an Award of Merit nine stems are required, and for a First Class Certificate eighteen. To be selected for trial at Kirton as a variety for cutting, or for trial at Kirton or Gulval as a variety for cutting from the open for market, twenty-four stems of daffodil must be shown. In order to be selected for trial at Kirton as a daffodil for garden decoration twelve stems are sufficient. For an Award of Merit as a daffodil for cultivation in pots, pans, or bowls, two pots, pans or bowls, each with not fewer than three bulbs, must be shown, and four pots, pans or bowls are required for a First Class Certificate. No fewer than twelve bulbs, growing in pots, bowls or boxes, must be shown in order that a daffodil may obtain any award as a variety for forcing for market. Directions regarding the vases to be used for daffodils are given on the entry forms. Of a tulip shown as a variety for garden decoration, six stems are sufficient to obtain a Preliminary

Commendation, but not fewer than twelve must be shown for an Award of Merit or a First Class Certificate. When staged as a tulip for forcing at least twelve plants must be exhibited as grown in not fewer than two pots, pans, bowls or boxes. A species or variety of a species of tulip may receive a Preliminary Commendation when only one stem is shown, but at least three stems are required for an Award of Merit or a First Class Certificate.

Trials of daffodils are carried out by the Holland County Council in co-operation with the Society at the Agricultural Institute and Experimental Station, Kirton, near Boston, Lincs. These trials are for varieties considered suitable for cutting, for cutting from the open for market or for garden decoration. Only varieties selected by the Narcissus and Tulip Committee at its meetings in London are grown in the trials at Kirton. Trials of varieties for cutting and for garden decoration are also conducted at Wisley. Trials of very early varieties considered suitable for cutting from the open for market are carried out by the Cornwall County Council in co-operation with the Society at the Experimental Station, Gulval, Penzance. Only very early varieties can be accepted for the trials at Gulval, and the Education Committee of the Cornwall County Council reserves the right to refuse any entry. Those who wish to send varieties for trial at Gulval should apply for entry forms to the County Horticultural Superintendent, County Hall, Truro. An award as a variety for cutting is usually given only after trial at Kirton or Wisley. An award as a variety for cutting from the open for market is usually given only after trial at Kirton or Gulval, but an award may be given to a variety which has been shown in London and favourably reported upon by an *ad hoc* Sub-Committee after examination of the variety whilst in bloom on the premises of the owner. An award as a variety for garden decoration is usually given to a daffodil only after trial at Kirton or Wisley, but it may be given to a tulip after examination of specimens exhibited in London.

In the interests of all concerned, it is very desirable that only registered names should be used for daffodils, and the Council appeals to all raisers, and to all who purchase stock of new varieties, to co-operate with the Society in its efforts to prevent the confusion which must inevitably arise if names are given without regard to those already in use. As soon as it is decided that a seedling is worth naming, and while the whole of the stock is in one person's hands, the proposed name should be submitted to the Secretary. Before choosing a name for submission for registration, the latest edition of The Classified List of Daffodil Names should be consulted. A registration fee of 1*s*. for each name should be sent with the application for registration.

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JOINT BORDER CARNATION AND PICOTEE COMMITTEE, 1938.

CHAIRMAN.

SUTTON, L. NOEL, Hillside, Reading, Berks.

BROWN, F. C., R.H.S. Gardens, Wisley. (*Secretary.*)

R.H.S. REPRESENTATIVES.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.
CHARRINGTON, E., Ice Wood Cottage, Limpsfield, Surrey.
CHURCHER, Major GEORGE, Beckworth, Lindfield, Haywards Heath, Sussex.
FAIRLIE, J., 17 Mayfield Road, Acton, W. 3.
GIBSON, J. L., c/o Gibson (Cranleigh), Ltd., The Gardens, Cranleigh, Surrey.

NATIONAL CARNATION AND PICOTEE SOCIETY'S REPRESENTATIVES.

GRAY, F. E., 14 Queen's Avenue, Woodford Green, Essex.
KEEN, J. J., 54 The Avenue, Southampton.
MAXFIELD, S., 19B Stone Street, Gravesend, Kent.
MUSTOW, A. E., 10 Brinkley Road, Worcester Park, Surrey. (*Hon. Secretary*, National Carnation and Picotee Society.)
THAIN, R., Hilandale, Guildown Avenue, Guildford, Surrey.
WILKINSON, Capt. E. M., Fernbank, Denville, Havant, Hants.

The Committee will meet at the following times:

at 11.30 A.M. at the Fortnightly Meetings on July 5 and 19; at 3 P.M. at the National Carnation and Picotee Society's Show on July 12; at 11.30 A.M. on July 26; and on notice at such other times as is necessary to deal with entries.

Entries must be handed to the Secretary of the Committee by 11.15 A.M. on any of the named dates, but when it is desired to submit a variety for certificate

in any week for which a meeting has not been arranged, the completed entry-form must reach the Secretary of the Royal Horticultural Society, or the Secretary of the National Carnation and Picotee Society, by the Tuesday in the preceding week.

Of new varieties placed before the Joint Committee not fewer than two blooms must be shown. These varieties may be selected for trial at Wisley and/or receive Preliminary Commendation. For an Award of Merit for exhibition not fewer than three blooms must be shown, and for an Award of Merit for the garden not fewer than three blooms must be shown, and three plants must be growing in the trials at Wisley. A First Class Certificate will be awarded only to a variety which has received an Award of Merit in a previous year, and at least seven blooms must be shown. In all cases, whenever possible, a growing plant should also be shown.

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JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE, 1938.

CHAIRMAN.

MONRO, GEORGE, C.B.E., V.M.H., 4 Tavistock Street, Covent Garden, W.C. 2.

BROWN, F. C., R.H.S. Gardens, Wisley. (*Secretary.*)

R.H.S. REPRESENTATIVES.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.
CARTER, E. R., Valhalla, Hartswood Road, Brentwood, Essex.
COOK, L. J., 7 Drapers Road, Enfield, Middlesex.
ENGELMANN, C., Saffron Walden, Essex.
INGAMELLS, D., 27 Catherine Street, Covent Garden, W.C. 2.

BRITISH CARNATION SOCIETY'S REPRESENTATIVES.

ALESWORTH, F. W., 17 Avenue Road, Isleworth, Middlesex. (*Hon. Secretary*, British Carnation Society.)
JORDAN, F., V.M.H., Yewdene, Edenbridge, Kent.
MASON, L., c/o H. T. Mason, Ltd., Eton Lodge, Hampton Hill, Middlesex.
METCALFE, A. W., Rozel, Hatfield Road, St. Albans, Herts.
WALLACE, W. E., J.P., V.M.H., Poplar Farm, Eaton Bray, Dunstable, Beds.
WRIGHT, G. H., The Gardens, North Mymms Park, Hatfield, Herts.

The Committee will meet at the following times:

at 12 NOON at the British Carnation Society's Shows on April 20 and November 29, and at such other times as is necessary to deal with entries.

At the British Carnation Society's Shows entries must be handed to the Secretary of the Committee by 11.30 A.M. When it is desired to submit a variety for certificate at one of the Royal Horticultural Society's Fortnightly Shows, the completed entry-form must reach the Secretary of the Royal Horticultural Society or the Secretary of the British Carnation Society by the Tuesday in the preceding week.

To obtain an Award of Merit, at least three open blooms and one plant in bloom must be shown. No award will be made to a perpetual-flowering carnation until the Committee has seen it twice within two years, once between November 1 and March 31, and once between April 1 and October 31. The period of the year for the second exhibition must differ by at least five months from the first. A First Class Certificate may be awarded only to a variety which has previously received an Award of Merit, and only after the Committee has inspected plants in growth between November 1 and March 31. Raisers who wish to enter a variety for a First Class Certificate must notify the Secretary of the Royal Horticultural Society, or the Secretary of the British Carnation Society, so that arrangements may be made for a visit of the Committee.

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JOINT DAHLIA COMMITTEE, 1938.

Deals with all Dahlias.

CHAIRMAN.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

CARTWRIGHT, W. D., R.H.S. Gardens, Wisley. (*Secretary.*)

R.H.S. REPRESENTATIVES.

COBB, A. J., The University, Reading, Berks.
CRANE, D. B., 50 Cholmeley Crescent, Cholmeley Park, Highgate, N. 6.
DRAYSON, G. F., 23 Palmerston Road, Buckhurst Hill, Essex.
FIFE, WILLIAM, c/o Dobbie & Co., Ltd., Edinburgh, 7.
RIDING, JAS. B., The Nurseries, Chingford, E. 4.
STEWART, W., Royal Hospital, Chelsea, S.W. 3.

NATIONAL DAHLIA SOCIETY'S REPRESENTATIVES.

ALESWORTH, F. W., 17 Avenue Road, Isleworth, Middlesex.
CAMPBELL, D., New Lodge, Inner Circle, Regent's Park, N.W. 1.
CHURCHER, Major G., Beckworth, Lindfield, Sussex.
EMBERSON, J., Green Hayes, Lindsey Street, Epping, Essex.
GIBBARD, H. S., 65 Woodstock Road, Wembley, Middlesex. (*Hon. Secretary,* National Dahlia Society.)
OGG, STUART, The Grove Nurseries, Swanley, Kent.
WEST, J. T., Tower Hill, Brentwood, Essex.

The Committee will meet at the following times:

at 11 A.M. at the Fortnightly Meetings on August 9 and 30; September 13 and 27; and October 11; and at 12.15 P.M. at the National Dahlia Society's Show on September 6.

Entries must be handed to the Secretary of the Committee at least half an hour before the time of meeting.

On any Show-day when no meeting of the Joint Committee has been arranged, dahlias should be entered with the Secretary of Floral Committee A.

At least three open blooms must be shown. Varieties considered worthy are selected for trial at Wisley and awards are made only after trial.

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JOINT DELPHINIUM COMMITTEE, 1938.

CHAIRMAN.

HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.

VICE-CHAIRMAN.

BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.

BROWN, F. C., R.H.S. Gardens, Wisley. (*Secretary.*)

R.H.S. REPRESENTATIVES.

CAMPBELL, D., New Lodge, Inner Circle, Regent's Park, N.W. 1.
INGAMELLS, D., 27 Catherine Street, Covent Garden, W.C. 2.
JANES, E. R., 12 Brooklyn Drive, Emmer Green, Reading, Berks.
LANGDON, C. F., V.M.H., Twerton Hill Nursery, Bath, Somerset.
SMITH, Mrs. LINDSAY, Postford House, Chilworth, Surrey.
STEVENSON, T., Colham Green Nurseries, Hillingdon, Middlesex.
WELLS, BEN, Hardy Plant Nurseries, Merstham, Surrey.

BRITISH DELPHINIUM SOCIETY'S REPRESENTATIVES.

BISHOP, F. A., The Glade, Clewer Green, Windsor, Berks.
CARLILE, T., Loddon Gardens, Twyford, Berks.
DOCWRA, Mrs. R. E., 31 Upper Brighton Road, Surbiton, Surrey.
HILL, C. F., Westover, Hartington Road, Hillingdon, Middlesex.
MACSELF, A. J., Domarin, Hamilton Road, Reading, Berks.
PHILLIPS, G. A., c/o Hewitt & Co., Ltd., The Nurseries, Stratford-on-Avon, Warwickshire.
ROBERTS, S. HALFORD, 85–86 New Bond Street, W. 1.
MOIR, A. J., 3 Warwick Road, Thornton Heath, Surrey. (*Hon. Secretary,* Delphinium Society.)

The Committee will meet at the following times:

at 11.15 A.M. at the Fortnightly Meetings on June 8 and 21 and July 5; at 12.15 P.M. at the British Delphinium Society's Show on Thursday,

June 30, and at 11.45 A.M. at the British Delphinium Society's Provincial Show at Alderley Edge on Saturday, July 16.

Entries must be handed to the Secretary of the Committee at least half an hour before the meeting.

On any Show-day, when no meeting of the Joint Committee has been arranged, Delphiniums should be entered with the Secretary of Floral Committee A.

When exhibited as a variety for show purposes, or as a variety for garden decoration, at least three spikes of flowers, either cut or on a plant or plants, are required, and when staged as a variety for cutting, sufficient cut spikes of flowers to fill a vase must be shown.

An award as a variety for garden decoration, or as a variety for cutting, is made only after trial at Wisley. Varieties submitted to the Committee at Shows, and considered worthy, are selected for trial.

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JOINT IRIS COMMITTEE, 1938.

CHAIRMAN.

STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.

VICE-CHAIRMEN.

MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.
PILKINGTON, G. L., Lower Lee, Woolton, Liverpool.

BROWN, F. C., R.H.S. Gardens, Wisley. (*Secretary.*)

R.H.S. REPRESENTATIVES.

BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.
BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Bulls Cross, Enfield, Middlesex.
CHRISTIE-MILLER, C. W., Swyncombe House, Henley-on-Thames, Oxon.
GALSWORTHY, FRANK, Green Lane Farm, Chertsey, Surrey.
LAWRENCE, Lady, Riverdale, Dorking, Surrey.
MEYER, Rev. Canon ROLLO, The Manor House, Little Gaddesden, Berkhamsted, Herts.
PESEL, Miss L. F., The White House, Colebrook Street, Winchester.
WELLS, BEN, Hardy Plant Nurseries, Merstham, Surrey.

IRIS SOCIETY'S REPRESENTATIVES.

BAKER, G. P., V.M.H., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.
BARR, G., c/o Barr & Sons, The Nurseries, Taplow.
BUNYARD, G. N., F.L.S., 10 Faraday Road, Maidstone, Kent.
HELLINGS, F. WYNN, Fleur de Lis, 41 Grove Way, Esher, Surrey.
LEVETT, Mrs. G. C., 29 Crescent Road, Kingston Hill, Surrey.
MURRELL, Mrs., c/o Orpington Nursery Co., Orpington, Kent.
PERRY, AMOS, V.M.H., Hardy Plant Farm, Enfield, Middlesex.
SPENDER, R. E. S., Chetwold, Yetminster, Dorset.
TOMALIN, F. W., 19 Gloucester Road, Hampton, Middlesex.
WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.

The Committee will meet at the following times :

at 12.45 P.M. on the first day of the Fortnightly Meetings on April 5 and 26, May 10, June 21, July 5 and 19; at 11.15 A.M. on Tuesday, May 24, at Chelsea, and at 2.15 P.M. at the Iris Society's Show on June 8.

Entries must be handed to the Secretary of the Committee by 10.15 A.M. at Chelsea and by 11.45 A.M. at all other meetings.

On any Show-day, when no meeting of the Joint Committee has been arranged, Irises should be entered with one of the Secretaries of the Floral Committees.

If an Iris is shown with a view to its being selected for trial, one flowering stem is usually sufficient, but in order to obtain an award as a plant for general garden use, as a plant for the rock garden, or as a variety for market, not fewer than three flowering stems must be shown. When entered as a plant for the alpine house an Iris must be represented by a plant or plants carrying not fewer than three flowering stems in all and growing in a pot or pan, or pots or pans. If exhibited as an ornamental pot-plant the plants must be in pots.

Awards are made to species and first crosses between species when exhibited in London. Irises of garden origin (other than first crosses between species) may receive awards when exhibited in London, if considered suitable for the rock garden, alpine house, or for cultivation as ornamental pot-plants, but those which are entered as suitable for general garden use or for market, if considered worthy, are selected for trial at Wisley, a certificate of Preliminary Commendation being the only award for which they are eligible without trial.

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JOINT RHODODENDRON COMMITTEE, 1938.

CHAIRMAN.

STEVENSON, J. B., Tower Court, Ascot, Berks.

VICE-CHAIRMEN.

ABERCONWAY, Lord, C.B.E., V.M.H., 38 South Street, Mayfair, W. 1.
WILDING, E. H., Wexham Place, Stoke Poges, Bucks.

STYLE, M. G. H., R.H.S. Offices. (*Secretary.*)

R.H.S. REPRESENTATIVES.

BEAN, W. J., C.V.O., I.S.O., V.M.H., 2 Mortlake Road, Kew, Surrey.
CLARKE, Col. STEPHENSON R., C.B., J.P., LL.D., V.M.H., Borde Hill, Haywards Heath, Sussex.
COMBER, J., V.M.H., The Gardens, Nymans, Handcross, Sussex.
CONGREVE, AMBROSE, Moncorvo House, Ennismore Gardens, S.W. 7.
DIGBY, Lord, D.S.O., M.C., Minterne Cerne Abbas, Dorset.
HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.
JAMES, The Hon. ROBERT, St. Nicholas, Richmond, Yorks.
OLDHAM, W. R., J.P., V.M.H., Chimney Close, Windlesham, Surrey.
PINCKNEY, G. H., c/o John Waterer, Sons & Crisp, Ltd., Bagshot, Surrey.
REUTHE, G., Sunnycroft, 109 Crown Lane, Bromley, Kent.
WALLACE, R. W., J.P., V.M.H., The Old Gardens, Tunbridge Wells, Kent.
WILLIAMS, C., M.P., 59 Tufton Street, Westminster, S.W. 1.

RHODODENDRON ASSOCIATION'S REPRESENTATIVES.

CROSFIELD, J. J., Embley Park, Romsey, Hants.
GODMAN, Dame ALICE, D.B.E., South Lodge, Horsham, Sussex.
HUTCHINSON, J., LL.D., F.L.S., The Herbarium, Royal Botanic Gardens, Kew, Surrey.
JENKINSON, Capt. R. C. H., Knap Hill Manor, near Woking, Surrey.
LODER, Lady, Leonardslee, Horsham, Sussex.
LODER, Lt.-Col. GILES, H., M.C., High Beeches, Handcross, Sussex.
ROSE, F. J., Townhill Park Gardens, West End, Southampton.
ROTHSCHILD, LIONEL DE, O.B.E., V.M.H., 18 Kensington Palace Gardens, W. 8.
SLOCOCK, O. C. A., Goldsworth Old Nursery, Woking, Surrey.
STRATHCONA AND MOUNT ROYAL, Lord, 14 South Audley Street, W. 1.
WALKER-HENEAGE-VIVIAN, Admiral A., C.B., M.V.O., D.L., Clyne Castle, Blackpill, Swansea, Glamorgan.
WILSON, GURNEY, F.L.S., c/o R.H.S. Offices. (*Secretary*, Rhododendron Association.)

The Committee will meet at the following times :

at 11.15 A.M. at the Fortnightly Meetings on March 8 and 22, April 5 and 26, May 10, June 8 and 21 ; at 12.15 P.M. at the Rhododendron Association's Show on May 3 ; and at 11.15 A.M. on Tuesday, May 24, at Chelsea.

Entries at the Chelsea Show must be handed to the Secretary of the Committee by 10.15 A.M. ; at other meetings at least half an hour before the meeting.

On any Show-day, when no meeting of the Joint Committee has been arranged, rhododendrons should be entered with the Secretary of Floral Committee B.

When shown as a plant for general garden use or as a plant for the greenhouse, a cut spray or truss is usually sufficient, but if possible a plant should be shown. At least one plant is required when a rhododendron is shown as suitable for the rock garden or alpine house, and in the latter case the plant must be growing in a pot or pan.

Trials of selected garden forms of azaleas, and of hardy hybrid rhododendrons, including azaleas, raised or shown by nurserymen, other than the results of first crosses made between species, are carried out at Exbury, and awards to these plants are made only after trial. All other rhododendron hybrids, as well as all species, are eligible for awards when exhibited in London.

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JOINT ROCK-GARDEN PLANT COMMITTEE, 1938.

The Joint Rock-Garden Plant Committee deals with all plants for the rock-garden or alpine house.

CHAIRMAN.

STERN, Major F. C., O.B.E., M.C., F.L.S., 16 Montagu Square, W. 1.

VICE-CHAIRMEN.

BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.
MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.

KAYE, A. W., R.H.S. Offices. (*Secretary.*)

R.H.S. REPRESENTATIVES.

BOWLES, E. A., M.A., F.L.S., F.R.E.S., V.M.H., Myddelton House, Bulls Cross, Enfield, Middlesex.
BYNG OF VIMY, The Viscountess, Thorpe Hall, Thorpe-le-Soken, Essex.
ELLIOTT, CLARENCE, Six Hills Nursery, Stevenage, Herts.
FENWICK, MARK, J.P., V.M.H., Abbotswood, Stow-on-the-Wold, Gloucestershire.
LAWRENCE, Lady, Riverdale, Dorking, Surrey.
PERRY, AMOS, V.M.H., Hardy Plant Farm, Enfield, Middlesex.
PRESTON, F. G., University Botanic Garden, Cambridge.
STOKER, Dr. FRED, F.L.S., V.M.H., The Summit, Golding's Hill, Loughton, Essex.

ALPINE GARDEN SOCIETY'S REPRESENTATIVES.

ANDERSON, E. B., Russetings, Loudwater, Rickmansworth, Herts.
BAKER, G. P., V.M.H., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent.
DONCASTER, E. D., Byways, Burley, near Ringwood, Hants.
GIUSEPPI, Dr. P. L., Trevose, Felixstowe, Suffolk.
INGWERSEN, W. E. TH., Birch Farm Hardy Plant Nursery, Gravetye, East Grinstead, Sussex.
PULHAM, J. R., 71 Newman Street, W. 1. (*Hon. Secretary*, Alpine Garden Society.)
REUTHE, G., Sunnycroft, 109 Crown Lane, Bromley, Kent.
ROSENHEIM, PAUL, 27 Spencer Road, East Molesley, Surrey.
WELLS, BEN, Hardy Plant Nurseries, Merstham, Surrey.

The Committee will meet at the following times:

at 12.30 P.M. on the first day of all Fortnightly Meetings; at 10.30 A.M. at Chelsea on Tuesday, May 24; and at 12.30 P.M. at the Alpine Garden Society's Shows on March 29, May 3 and September 6.

Entries must be handed to the Secretary of the Committee by 10.15 A.M. at Chelsea and by 12 NOON on all other occasions when the Committee meets.

At least one plant must be shown, and for an award as an alpine house plant the plant must be growing in a pot or pan.

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JOINT SWEET PEA COMMITTEE, 1938.

CHAIRMAN.

LEAK, G. W., V.M.H., Flint House, Wisbech, Cambs.

BROWN, F. C., R.H.S. Gardens, Wisley. (*Secretary.*)

R.H.S. REPRESENTATIVES.

ALLAN, D., c/o Dobbie's Seed Farms, Marks Tey, Essex.
CAMPBELL, D., New Lodge, Inner Circle, Regent's Park, N.W. 1.
CRANE, D. B., 50 Cholmeley Crescent, Cholmeley Park, Highgate, N. 6.
DAWKINS, A., c/o Alfred Dawkins (Chelsea), Ltd., 408 King's Road, Chelsea, S.W. 10.

METCALFE, A. W., Rozel, Hatfield Road, St. Albans, Herts.
WILSON, J., The Gardens, Trent Park, New Barnet, Herts.

NATIONAL SWEET PEA SOCIETY'S REPRESENTATIVES.

BARTLETT, A. V., 19 Bedford Chambers, W.C. 2. (*Hon. Secretary*, National Sweet Pea Society.)
BOLTON, T., c/o R. Bolton & Son, Birdbrook, Essex.
BURT, G. H., Grange Hill, Coggeshall, Essex.
CHRISTY, E. H., Greenways, Ingatestone, Essex.
GOWER, A. W., Calcot Grange Gardens, Reading, Berks.
JANES, E. R., 12 Brooklyn Drive, Emmer Green, Reading, Berks.
MACGREGOR, J., c/o Carters' Tested Seeds, Raynes Park, S.W. 20.
STEVENSON, J., Poole Road, Wimborne, Dorset.

The Committee will meet at the trials at Wisley on receipt of notice.

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JOINT COMMITTEE FOR COMMERCIAL FRUIT TRIALS, 1938.

CHAIRMAN.

HALL, Sir DANIEL, K.C.B., F.R.S., D.Sc., LL.D., V.M.H., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.

R.H.S. REPRESENTATIVES.

BEAR, E. M., Fruit Farm, Magham Down, Hailsham, Sussex.
BUNYARD, E. A., F.L.S., Allington, Maidstone, Kent.
CHITTENDEN, F. J., F.L.S., V.M.H., R.H.S. Hall, Vincent Square, S.W. 1.
CRANE, M. B., A.L.S., John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19.
HATTON, R. G., C.B.E., M.A., V.M.H., East Malling Research Station, East Malling, Kent.
NEAME, THOMAS, The Offices, Macknade, Faversham, Kent.
SMITH, CUTHBERT S., Elm House, Boughton, Monchelsea, Maidstone, Kent.

MINISTRY OF AGRICULTURE AND FISHERIES' REPRESENTATIVES.

BARKER, Prof. B. T. P., M.A., University of Bristol Research Station, Long Ashton, Bristol.
FRYER, J. C. F., O.B.E., M.A., F.R.E.S., Plant Pathological Laboratory, Milton Road, Harpenden, Herts.
LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.
LOBJOIT, Sir WILLIAM G., O.B.E., J.P., V.M.H., Oakdene, Wooburn, High Wycombe, Bucks.
TAYLOR, H. V., O.B.E., D.Sc., V.M.H., Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W. 1.

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EXHIBITION COMMITTEE, 1938.

CHAIRMAN.

MUSGRAVE, C. T., V.M.H., Olivers, Hascombe, Godalming, Surrey.

VICE-CHAIRMEN.

LEAK, G. W., V.M.H., Flint House, Lynn Road, Wisbech, Cambs.
MONRO, G., C.B.E., V.M.H., 4 Tavistock Street, Covent Garden, W.C. 2.

ALLWOOD, M. C., F.L.S., Wivelsfield Nurseries, Haywards Heath, Sussex.
BOWES-LYON, The Hon. DAVID, St. Paul's Waldenbury, Hitchin, Herts.
BUNYARD, G. N., F.L.S., 10 Faraday Road, Maidstone, Kent.
DU CANE, General Sir JOHN, G.C.B., 28 Draycott Place, S.W. 3.
ELLIOTT, CLARENCE, Six Hills Nursery, Stevenage, Herts.
FIFE, WILLIAM, c/o Dobbie & Co., Ltd., Edinburgh, 7.
HARVEY-CANT, F. S., Braiswick Rose Gardens, Colchester, Essex.
HAY, T., M.V.O., V.M.H., New Lodge, Hyde Park, W. 2.
LANGDON, C. F., V.M.H., Twerton Hill Nursery, Bath, Somerset.
NIX, C. G. A., V.M.H., Tilgate, Crawley, Sussex.
OLDHAM, W. R., J.P., V.M.H., Chimney Close, Windlesham, Surrey.
PINCKNEY, G. H., c/o John Waterer, Sons & Crisp, Ltd., Bagshot, Surrey.

RIDING, JAS. B., The Nurseries, Chingford, E. 4.
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SANDER, FREDERICK K., The Camp, St. Albans, Herts.
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* Wisley Advisory Scientific Sub-Committee, 1938.

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* Wisley Advisory Scientific Sub-Committee, 1938.

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The Committee will meet at the following times:

At 11.30 A.M. on the first day of each Fortnightly Meeting during January, February, November and December.

* * *

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SCHEEPERS, JOHN T., 522 Fifth Avenue, New York, U.S.A.
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STOYANOFF, Prof. N., Faculty of Sciences, Sofia University, Sofia, Bulgaria.
UNGER, ALFRED, Heidelburg-Schlierbach, Germany.
VOLLMER, Dr. A. M., 384 Post Street, San Francisco, U.S.A.
WADA, K., Hakoneya Nurseries, Numazu-shi, Japan.
WARD, F. KINGDON, V.M.H., Cleeve Court, Streatley-on-Thames, Berks.

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Established A.D. 1897, with the gracious assent of Her Majesty Queen Victoria in perpetual remembrance of Her Majesty's glorious reign, and to enable the council to confer conspicuous honour on those British Horticulturists resident in the United Kingdom whom it might from time to time consider deserving of special honour at the hands of the Society. At the time of its institution the Medal was confined to 60 recipients in reference to the 60 years of Her Majesty's reign. At Her Majesty's death it seemed to the council fitting that the number of Medallists should be increased to 63, representing the full number of the years of her reign.

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1917 BEAN, W. JACKSON, C.V.O., I.S.O., 2 Mortlake Road, Kew, Surrey.
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1933 FARMER, Sir JOHN, LL.D., D.Sc., F.R.S., St. Leonards, Weston Road, Bath.
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1897 BOXALL, W. (d. 1910).
1897 BULL, WILLIAM, F.L.S. (d. 1902).
1897 BUNYARD, GEORGE (d. 1919).
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1902 CANNELL, HENRY (d. 1914).
1904 CHALLIS, THOMAS (d. 1923).
1914 CHEAL, JOSEPH (d. 1935).
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1897 DUNN, MALCOLM (d. 1899).
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1897 MILNER, HENRY ERNEST, F.L.S. (d. 1906).
1897 MOLYNEUX, EDWIN (d. 1921).
1897 MONRO, GEORGE (d. 1920).
1925 MOORE, G. F. (d. 1927).
1897 MORRIS, Sir DANIEL, K.C.M.G. (d. 1933).
1924 MORRIS, SYDNEY (d. 1926).
1925 MOUNT, GEORGE (d. 1927).
1897 NICHOLSON, GEORGE, F.L.S. (d. 1908).
1901 NORMAN, GEORGE (d. 1906).
1897 O'BRIEN, JAMES (d. 1930).
1901 ORMEROD, Miss E. A., LL.D. (d. 1901).
1897 PAUL, GEORGE, J.P. (d. 1921).
1897 PAUL, WILLIAM, F.L.S. (d. 1905).
1911 PEARSON, ALFRED H., J.P. (d. 1930).
1924 PEARSON, CHARLES E. (d. 1929).
1914 PINWILL, Capt. W. (d. 1926).
1922 POUPART, WM. (d. 1937).
1904 REDESDALE, Lord, G.C.V.O., C.B. (d. 1916).
1897 RIVERS, T. FRANCIS (d. 1899).
1925 ROCHFORD, J. (d. 1932).
1921 ROLFE, R. A., A.L.S. (d. 1921).
1917 ROLLIT, Sir A. K., D.C.L., LL.D. (d. 1922).
1908 ROSS, CHARLES (d. 1917).
1897 ROTHSCHILD, Lord, M.A., Ph.D., F.R.S., F.L.S. (d. 1937).
1897 SANDER, FREDERICK, F.L.S. (d. 1920).
1897 SCHRÖDER, Baron Sir HENRY, Bt., C.V.O. (d. 1910).
1897 SEDEN, JOHN (d. 1920).
1897 SHERWOOD, N. N. (d. 1916).
1916 SLOCOCK, W. C. (d. 1926).
1897 SMITH, JAMES (d. 1903).
1897 SMITH, MARTIN R. (d. 1908).
1906 SMITH, THOMAS (d. 1919).
1897 SPEED, WALTER (d. 1921).
1927 STAPF, Dr. O., F.R.S., F.L.S. (d. 1933).
1897 SUTTON, A. W., J.P., F.L.S. (d. 1925).
1901 SWEET, JAMES (d. 1924).
1926 THEOBALD, Prof. F. V., M.A., F.E.S. (d. 1930).
1897 THOMAS, OWEN (d. 1923).
1897 THOMPSON, DAVID (d. 1909).
1897 THOMPSON, WILLIAM (d. 1903).
1897 TURNER, HARRY (d. 1906).
1906 VEITCH, Sir HARRY J., F.L.S. (d. 1924).
1916 VEITCH, P. C. M., J.P. (d. 1929).
1936 WAKEHURST, Lord, F.L.S. (d. 1936).
1926 WATKINS, A. (d. 1937).
1916 WATSON, W., A.L.S. (d. 1925).
1927 WHITE, J. T. (d. 1930).
1912 WHITTON, J. (d. 1925).
1914 WHYTOCK, JAMES (d. 1926).
1912 WILKS, Rev. WILLIAM, M.A. (d. 1923).
1927 WILLIAMS, P. D. (d. 1935).
1897 WILLMOTT, Miss E., F.L.S. (d. 1934).
1912 WILSON, Dr. E. H., M.A. (d. 1930).
1897 WILSON, G. F., F.R.S., F.L.S. (d. 1902).
1897 WOLLEY-DOD, Rev. C., M.A. (d. 1904).
1897 WRIGHT, JOHN (d. 1916).
1920 WRIGHT, SAMUEL T. (d. 1922).
1897 WYTHES, GEORGE (d. 1916).

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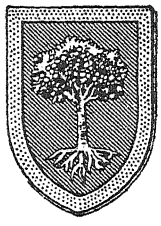
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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXIII  Part 2

February 1938

FORTHCOMING EVENTS.

A FORTNIGHTLY SHOW will be held on February 8 (12 noon to 5 P.M.), and a Lantern Lecture will be given in the afternoon at 3.30 o'clock by Mr. G. W. ROBINSON, the newly appointed Curator of the Chelsea Physic Gardens, on "New Introductions for the Rock Garden."

The two-day Fortnightly Shows will begin on February 22 (12 noon to 7.30 P.M.) and 23 (10 A.M. to 5 P.M.), and in the afternoon of February 22, at 3 o'clock, the Annual General Meeting of the Society will be held, when the President will give an account of the past year's work and present the Report which will be found on p. i. The Treasurer will make a statement regarding the annual accounts (pp. x–xxi), and the cups and medals, particulars of which will be found in the Annual Report (p. vii), will be presented.

On March 8 (12 noon to 7.30 P.M.) and 9 (10 A.M. to 5 P.M.) there will be a Fortnightly Show, and Mr. R. B. DAWSON will lecture on "The Upkeep of Garden Lawns" at 3.30 P.M. on March 8.

At Wisley on March 9 and 10 there will be a Practical Demonstration (weather permitting) of Seed Sowing, Indoors and Outdoors. Fellows who wish to attend this Demonstration should inform the Director of the Gardens beforehand, so that all arrangements can be made for the comfort of those attending the Demonstration.

The Written Examination for the British Floral Art Diploma will be held on February 16, and the practical portion of this examination will follow on March 16 and 17. Further information regarding the latter will be given in the March JOURNAL.

Entries for the Chelsea Flower Show close on March 1.

The full Calendar for the year will be found at the beginning of the January JOURNAL.

A Conference on Flowering Trees and Shrubs will be held from April 26 to 28. Fellows will have a good opportunity of gathering knowledge on these important plants for the garden. Papers will be read on the following subjects: "Arrangement of Flowering Trees and Shrubs, including their use on Walls, Rock Gardens, etc."; "Flowering Trees and Shrubs for Various Climates and Soils"; "Other Families of Flowering Trees and Shrubs"; and special papers on "Cherries, Crabs and their Allies," "Brooms and the Cistus Family," "Cotoneasters, Viburnums and Barberries," "Lilacs, Philadelphus, Deutzias, Weigelias, Hibiscus and Escallonias," "Magnolias and Camellias," and on "Propagation" and "Pruning." The papers will be illustrated by lantern slides.

The papers will be published as a separate volume, which will also contain contributions from abroad, including "Notes on New Varieties of Lilacs in Canada," by Mr. M. B. DAVIS, Dominion Horticulturist, Ottawa, and "Notes on Flowering Trees and Shrubs in Southern Chile," by Professor O. H. GOODSPEED, Ph.D.

There will be a special show of flowering trees and shrubs during the three days, and the following competitive classes for amateurs have been arranged:

Class A.—8 varieties of trees and/or shrubs in bloom, 1 vase of each. Rhododendrons and Azaleas excluded.

First prize, Silver Trophy; Second, £2; Third, £1.

Class B.—4 varieties of trees and/or shrubs in bloom, 1 vase of each. Rhododendrons and Azaleas excluded.

First prize, £3; Second, £1 10s.; Third, 15s.

A competitor may enter in Class A or Class B, but not both.

Class C.—1 vase of a tree or shrub in bloom. Rhododendrons and Azaleas excluded.

First prize, £1; Second, 15s.; Third, 10s.

A competitor may not exhibit in Class C any plant which he is exhibiting in Class A or Class B.

Class D.—1 vase, pot or tub of a tree or shrub in bloom, species, not introduced before 1920. Rhododendrons and Azaleas excluded.

First prize, £1; Second, 15s.; Third, 10s.

Will Fellows desirous of attending the Conference communicate as soon as possible with the Secretary, who will forward the full particulars of papers, publications, competitive classes, excursions and luncheon.

* * * * *

Fellows are reminded that subscriptions are due on January 1. Fellows who prefer to be relieved of the trouble of sending their subscriptions annually can obtain a banker's order from the Secretary.

Fellows are advised to return applications for plants and seeds before March 12. The necessary papers for making these applications

were enclosed in the January JOURNAL. Only Fellows whose subscriptions for 1938 have been paid are entitled to partake in the distribution.

Changes of address should be notified as soon as possible.

* * * * *

Wisley Gardens in February.—Visitors to the Gardens in February will find many plants in bloom both indoors and out.

Perhaps the most striking is the Mimosa, *Acacia dealbata*, which has been growing for many years in the angle of the wall near the entrance to the Laboratory. Other Acacias are in the Temperate and Half-hardy houses, together with many other nearly hardy shrubs, and Epacris from Australia and Heaths from South Africa. Several varieties of *Primula malacoides*, *Coleus Frederici* and Cinerarias are flowering in the Plant house.

The Alpine house and adjacent frames contain many Saxifrages in flower and early-flowering bulbs; and on the Rock Garden itself the fine Snowflake *Leucojum vernum Vagneri* is in profusion near the top, and lower down the Soldanellas are in bloom.

In the Wild Garden Daphnes, Pieris, Mahonias are in bloom, and so are *Narcissus cyclamineus* and the Hepaticas beneath the trees; while Seven Acres is full of interest and colour, both from flowers and berries and from coloured stems and bursting buds.

* * * * *

Publications.—The attention of the Fellows is drawn to the advertisement, on the inside front cover page, of the Society's recent publications: the Index to the Society's JOURNAL from 1838 to 1935, and List of Awards made to Plants, Fruits and Vegetables from 1859 to 1935, and "Some Good Garden Plants," containing descriptions of and the ways to cultivate plants that have received the Award of Garden Merit.

The Daffodil and Lily Year Books for 1937 are now obtainable, as well as the Diary for 1938.

The Horticultural Colour Chart has had, unfortunately, a setback owing to certain technical difficulties, and it is regretted there will be some delay before it can be published. Subscribers will be informed of the date of publication. Applications for the book can still be received.

* * * * *

The Halls have been let as follows:

From February 14 to 17 for an Amusement Trades Exhibition. Particulars obtainable from Mr. E. GRAVES, Cromwell House, Fulwood Place, W.C. 1.

From February 28 to March 4 for the Nursing Exhibition. Particulars obtainable from Mr. E. SCHOFIELD, 40 Holland Park, W. 11.

From February 28 to March 5 for the Annual Badminton Tournament. Particulars obtainable from Mr. C. MARRIOTT, c/o The Badminton Association of England, 20 Telford Avenue, Streatham Hill, S.W. 2.

BOOKS FOR A GARDENER'S LIBRARY.

By E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H.

[Read November 9, 1937.]

THERE are now so many books suitable for the amateur gardener's bookshelves that it would be possible to spend the quarter of an hour allotted to me in reading out a list of titles. There are nearly as many books as amateurs, so I will try to give short descriptions of books that I consider almost indispensable.

I dealt with the same subject in 1914 in a lecture published in the JOURNAL of the Royal Horticultural Society for the following year. In 1915 my subject was "Books on Rock-Gardening and Alpine Plants"; and in November 1917 I dealt with "Monographs for an Amateur Gardener's Library." Reports of these will be found in vols. 41 and 43 of the Society's JOURNAL.

Though I need not go over much of the ground then covered, it may be helpful to refer to certain books which are still the best of their kind. I maintain now, as I did in 1914, that ROBINSON'S English Flower Garden is the book that every would-be gardener should begin with. It was my first love and I am still faithful to it.

It has many advantages for the beginner. There are good pictures, mostly engravings from photographs, on almost every page, and a beginner learns much more pleasantly and easily through the eye than by reading long and often strange words.

The pictures I saw in ROBINSON'S English Flower Garden still delight me and lead me on to plan plantings in imitation of the effects they represent.

There are two editions, an early and a later one, in the show-case at my right hand. They show how greatly the book has grown, as a good garden does, in the years covered by its numerous editions.

Perhaps you will like to examine them at the close of the lecture.

Again, it is valuable because the accounts of the principal families dealt with were written by experts.

Few people realize that the book was not written entirely by WILLIAM ROBINSON. His was the great mind behind the work, but one of his chief assets was his capacity for finding the right man to do the job he did not want to do himself.

Some of the articles are signed by the full name of the writer, as for instance that on Bamboos signed "A. B. FREEMAN-MITFORD," afterwards Lord REDESDALE. Others are only initialled, like those on Narcissus and Saxifraga by "F. W. B." written by F. W. BURBIDGE, the Curator of Trinity College Garden in Dublin. D. DEWAR provided the Eryngium account. A list of those who contributed, either

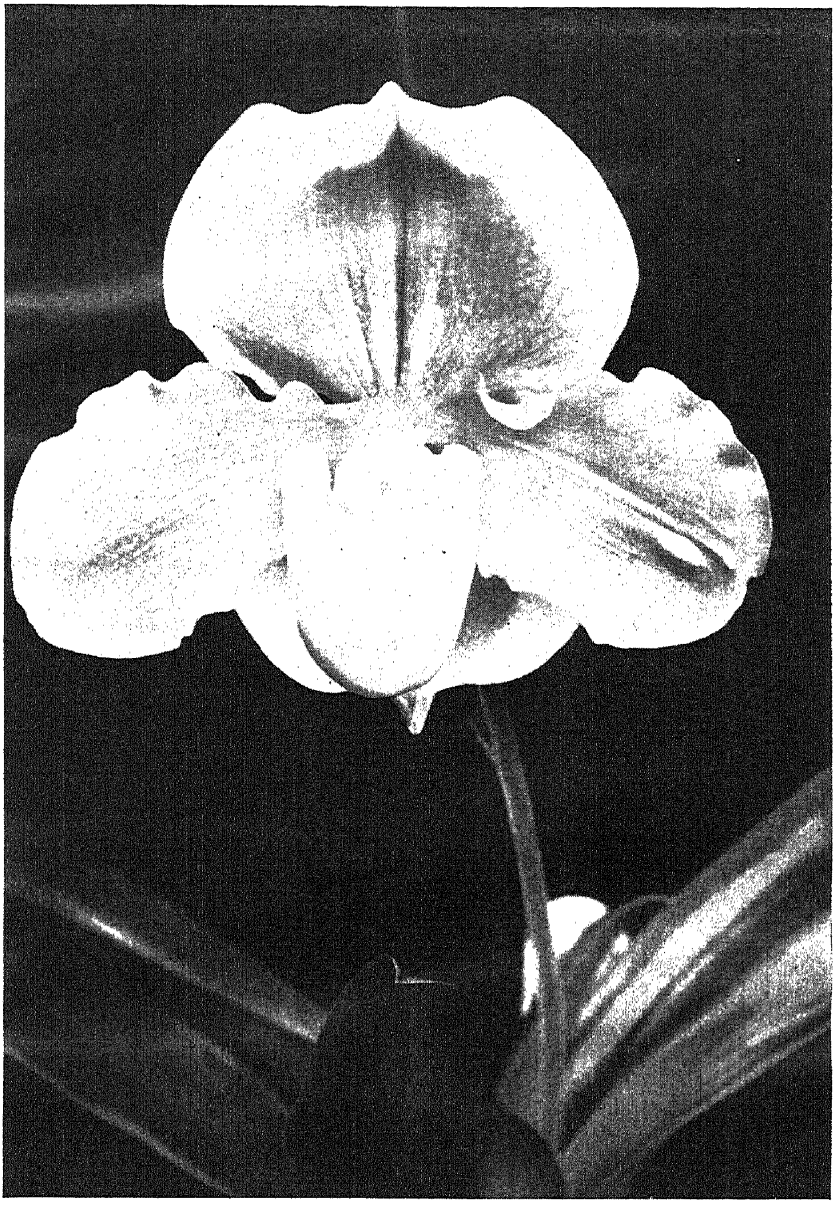


FIG. 1.—CYPRIPEDIUM 'DIANA BROUGHTON' VAR. 'ALCESTIS.'
(p. vii)
Adjudged the best new Cypripedium shown to the Society in 1937.

[*To face p.* 68.

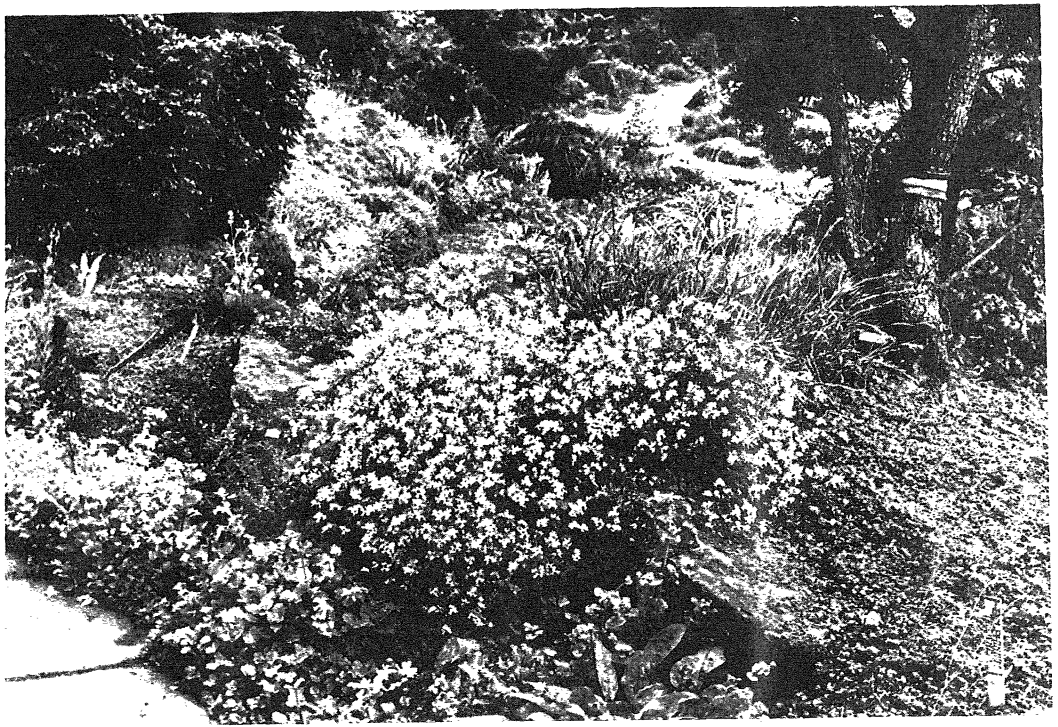


FIG. 2.—GENISTA LYDIA (**A.M.** JUNE 8, 1937) AT WISLEY.

directly to this book or through articles first published in The Garden, follows the Foreword.

I strongly advise everybody to read or re-read Miss JEKYLL'S first and, I think, best book—Wood and Garden. She never wrote anything that was not interesting and I have all of her books, but have favourites among them and consider Wood and Garden the most useful and stimulating. In it this very clever, artistic and practical lady first gave us her views about what a garden ought to be, and no one has as yet done it better.

Home and Garden, which followed, disappointed me, perhaps because the former book was so excellent, or perhaps because I have no cat and do not want one, so that the Home Pussies chapter is not for me. Neither do I like the dusty, stuffy scent of Pot-pourri sufficiently to learn how to make it. For all that, a book so full of good photographs and homely hints is worth a place on your bookshelf.

A good test of the value of a book is to notice whether its owner keeps it where he can reach it easily. If it is on a top shelf where the library steps must be used to get at it, and it is found to be dusty, it is not a favourite.

The books I use frequently are arranged close to my hand, where I can reach them without standing on a chair. Miss JEKYLL'S books are fairly handy but shut up behind glass as they are not taken out very often, and I prize them too much to let them become dusty.

If room cannot be found for all, select Colour in the Flower Garden if only for its historic value. This book has been responsible for many an overcrowded, gaudy jumble of flowers believed to be a colour scheme, and sometimes called a Jekyll Border.

Perhaps this book overstresses the importance of arranging plants to obtain a mass of colour, at the expense of hiding the natural charms of growth and form. Chapter IV appeals most to me. It describes a Hidden Garden, surrounded by Evergreen Oaks and Hollies, containing plants with beautiful foliage, such as Ferns, Solomon's Seal, Epimedium, *Euphorbia Wulfenii*, and many with white flowers.

Gardens for Small Country Houses, written in collaboration with Sir LAWRENCE WEAVER, is entertaining, but may stir up a spirit of envy among gardeners with small houses who cannot afford such expensive pavements, clipped hedges and garden ornaments as those shown in the beautiful illustrations.

Flower Decoration in the House shows how delightful quite common plants can be when arranged boldly in suitable vases, pots or jugs. The excellent photographic illustrations provide many useful hints for unusual effects.

Those wishing to study gardening more thoroughly will find NICHOLSON'S Illustrated Dictionary of Gardening a valuable book. Its four volumes and the Century Supplement contain some of the best illustrations of the habits of plants I have seen, and so much wisdom that he who can remember a hundredth part of it will have

little difficulty in making a good garden. Unfortunately it is out of print.

It has been superseded in some ways by the Cyclopedia of Horticulture, by L. H. BAILEY, the chief merit of which is the provision of easily worked keys for the principal genera which save the reading through of the descriptions of species from A to Z as we must in using NICHOLSON. The cultural directions are arranged for the needs of the United States, which detracts from its usefulness here.

JOHNSON'S Gardener's Dictionary, published in 1846, was brought up to date in 1917 by FRASER and HEMSLEY. I find it the handiest book for quick reference when writing and seized with doubt whether to use, let us say, one *l* or two. If kept on the writing desk it saves no end of time and thinking. All names are accented to help with right pronunciation. The derivations of generic names are explained and English equivalents are given for the specifics. For instance, *Helia'nthemum* from *helios*, the sun, and *anthemon*, a flower; *Eriocau'lon* (woolly-stemmed), *polifo'lium* (Polium-leaved). Or again, *Mesembrya'nthemum*, from *mesembria*, mid-day . . . referring to the flowers opening better on sunny days; *falcifo'rme* (sickle-shaped), *linguifo'rme* (tongue-shaped), *inclau'dens* (not-closing).

This should be of good service to those who complain that they cannot remember the names of plants, the chief cause of their difficulty being that they do not know what the words mean if they are only sounds and do not bring up any pictures before their eyes.

There is little excuse for ignorance nowadays, because several books have been written lately which make learning not a toil but a pleasure.

I can recommend The Gardener's Companion, edited by MILES HADFIELD, which appeared last year; Messrs. BUNYARD, JASON HILL, using his nom-de-plume, GIFFARD WOOLLEY and FITCH DAGLISH—each provides parts of this marvellous book, full of information and charm. It contains such a good list of books suitable for amateurs that you would be spending your time very much better reading that book than sitting here listening to me.

Professor SALISBURY'S The Living Garden is a wonderful book that bridges the great gulf between the botanist and the gardener. There is no need for that gulf if only the botanist would try to understand what the gardener wants to see in his plants, and the gardener would try to learn something of what the botanist has found out about them. Read that book and you will find out why holly leaves are fringed with hoar-frost while the centre of the leaf is without any. There is a charming chapter on seed production which makes the subject so clear and interesting that one looks upon the fading flowers with a new interest after having read it. A fascinating chapter is upon weeds, and another on the garden under the soil deals with roots. There is a most delightful folding plate drawn by the author so clearly and beautifully that no one should fail to recognize the different forms of plant roots after studying it.

When travelling, I generally take WILLIS's Flowering Plants and Ferns with me, because I can get so much out of it when away from my other books.

Since my talk on Rock Garden books the most important addition is REGINALD FARRER'S The English Rock Garden, perhaps the most precious heritage he has left us. Every sentence in it is a polished gem of information, and most of them sparkle with brilliant wit.

Now Dr. SAMPSON CLAY has brought it up to date with another volume, The Present-day Rock Garden, to fill in the gaps in the former two. He has modelled it on FARRER'S lines and has made a brave attempt to keep pace with the spate of new plants that collectors have been pouring in. It is a charming book, but I must confess that my copy is still only half cut. I cannot go on reading it for long at a time, because there is such an enormous flood of new genera and species I have not heard of before, that I get a sort of horticultural indigestion and have to put it down for a while. It is saddening, too, to find there are so many wonderful plants in the world that we may never get a chance of growing and knowing, as they have not yet been introduced.

DAVID WILKIE'S book on Gentians fills me with gratitude. It is delightful to have such an authoritative account of that interesting family and instructions for the best methods of cultivation for so many of those mentioned. Also when asked puzzling questions about Gentians it is so helpful to be able to ask "What does WILKIE say about it?"

The third volume of BEAN'S marvellous book on Trees and Shrubs has come to help us with the newer introductions. The three volumes are rather expensive, but well worth the cost.

Those asking for a cheaper book will find the same author's two smaller books useful. They are Shrubs for Amateurs and Ornamental Trees for Amateurs.

Again, E. T. COOK'S Trees and Shrubs for English Gardens, an older book, is useful as containing a good list, and sufficient information about those a beginner would want to grow.

I am glad to learn that Mr. CHARLES ELEY'S book, Gardening for the Twentieth Century, is about to appear in a second edition. He has had a great experience in laying out his garden in Suffolk, so that in these hard times trees and shrubs can look after themselves and grow into beauty with very little labour. It is written in a pleasant way with much dry humour and apt quotation, while its non-technical language makes it easy reading for the amateur.

Outstanding books of literary charm number amongst them Sir ARTHUR HORT'S two books, The Unconventional Garden and his posthumous work Garden Variety, both full of scholarly knowledge and the practical wisdom acquired during many years of successful work in his gardens. He tells us to grow Irises as "dry as you dare," and delightfully defines a synonym as only the same plant in other words.

JASON HILL'S The Curious Gardener is another book that the amateur should keep close to the fireside, so that when he comes in cold and tired after wintry weeding he can put on his slippers and take up a book until the tea kettle boils. There is a charming chapter in The Curious Gardener called "The Invisible Garden," dealing with the fragrance of flowers. For a fuller treatment of this subject there is the same author's The Scent of Flowers, published by Dulau & Co. in 1925—a scientific study of the sense of smell and its function, as well as the sources and distribution of scent in flowers and its extraction for the manufacture of perfume: a learned, useful and interesting book.

Sir HERBERT MAXWELL, who has lately been called to his rest at such a great age, has left us, among his writings on many varied subjects, two beautifully illustrated gardening books. Scottish Gardens, published in 1908, is illustrated in colour from thirty-two paintings by MARY G. W. WILSON, and the text is a fine example of Sir HERBERT'S versatile knowledge and charm of expression. The other, Flowers, a Garden Note Book, appeared in 1923, and contains twelve reproductions in colour of the author's beautiful flower pictures.

There are also books now out of print that the keen amateur should look out for in booksellers' lists. Among them are the score and more of volumes on special subjects, published by John Lane early in this century as Handbooks of Practical Gardening, edited by HARRY ROBERTS. Also the later series called Present Day Gardening, edited by R. HOOPER PEARSON and published by Messrs. Jack, with coloured illustrations. Any volume of either of these series is worth adding to your store.

Finally, you *must* have EDEN PHILLPOTTS' book My Garden, The Country Life Library, 1906. For fireside reading there is nothing so full of fun, beautiful photographic illustrations and first-hand descriptions of an amateur's experiences with the growing of many unusual plants. I owe it a debt of gratitude for the expressive phrase, "it is as hardy as a Polar bear," and can always chuckle over this abridged quotation from the Introduction: "There are two sterling tests of a true gardener. . . . First, take nurserymen's catalogues. Should you love these things; . . . make yourself believe them by exercise of pure faith; gloat over their luscious adjectives, and neglect your duties and waste hours in turning their pages; should you make lists out of them and pretend that you are only doing it for fun, yet conclude by getting these lists posted . . . then you are a real gardener, and I shake your horny hand. . . .

"A second test is the butterfly question. When horticulturists, so-called, invite me to beam upon these gorgeous insects . . . in the middle of something that cost money, I know that I am dealing with ignorance. . . . If you are an entomologist well and good. . . . The more butterflies you catch and pin into boxes, the better I shall like you. But should you be a gardener, the case is different; . . . there

is no place for butterflies in a properly kept border. Off with them! Down with them! . . . You will call these cruel words, and perhaps tell me that they only come for nectar; . . . there would be no difficulty with *me* about nectar; but mark this: it is not what a butterfly takes, but what she leaves, that makes me adamant against them. The females lay eggs in a prodigal and generous spirit. Nothing at five shillings a dozen will do for them. They choose a specimen plant for every accouchement . . . and so that your buds and their eggs shall burst into fulness of life together and many a jolly young caterpillar comes to a squashy end."

Time will not permit further extracts, much as I should enjoy reading and you would hearing them, so I wish you all good hunting in the book lists and well-filled shelves.

BOOKS ON FRUIT AND VEGETABLES FOR THE AMATEUR.

By E. A. BUNYARD, F.L.S.

[Read November 9, 1937; Mr. E. A. BOWLES in the Chair.]

THE literature of pomology is now so large—much of it of a specialist character—that I shall here confine myself to those books which are suitable for the amateur and private gardener.

In the JOURNAL of this Society, vol. 40, part 3 (1914), I described and catalogued the books dealing with fruit in some detail, including those illustrating and describing fruits which have been published in all countries. Those who would like to explore a wider range of books are referred to that article.

The amateur who is interested in fruit will perhaps first want a work describing the different varieties, and, if possible, with coloured plates. Here, unfortunately, the choice is very restricted.

The last book of importance published in this country is the Herefordshire Pomona, by Drs. HOGG and BULL, published in 1876–1885. This is a large folio and contains 76 plates illustrating several hundred varieties of Apples and Pears. The plates are very good, and show a great number of English Apples and most of the French and Belgian Pears that we grow to-day. Dr. BULL was especially interested in Cyder Apples, and many of them, as well as Perry Pears, are illustrated.

Another book of great value for the old English Apples is the Pyrus Malus Brentfordiensis of RONALDS, a nurseryman of Brentford. This was published in 1831 and is a large quarto with 42 plates illustrating 180 varieties. There are short descriptions of each fruit, but none of the tree, leaf or flower characters.

For those interested in the old English Apples and Pears, these two books are indispensable. They are, of course, out of print, but can be obtained fairly easily from second-hand booksellers: the Herefordshire Pomona at about £8, and Pyrus Malus Brentfordiensis at £5 or so, according to condition and binding.

The next work is the Fruit Manual of Dr. HOGG, the most important work on fruit so far published in England. Appearing in 1860 as a small duodecimo of 280 pages, it increased in size, and the last (fifth) edition, of 1884, is a stout octavo of 759 pages and describes all the fruits grown in English gardens. This is still the great classic of English pomology and is indispensable.

The descriptions are of the fruits only, and one could have wished that the tree characters could have been included as they are in the great French and German pomologies. We realize, however, that Dr. HOGG was a busy journalist after his early days as a nurseryman,

and that a work such as we should like would be a lifetime's task, and are thankful for the great book which has come down to us.

The only systematic book since that day covering all hardy fruits is my own Handbook of Fruits, 2 vols., octavo, published in 1920 and 1925. All hardy fruits are included in the 463 pages of the two volumes, Apples and Pears (515 varieties) in vol. i, Stone and Bush Fruits (about 400 varieties) in vol. ii. The book includes descriptions of the fruit, flower, leaf and tree for each variety; a reference to a coloured plate where it exists; an historical account; and keys to the different kinds as a help to identification.

The most recent book on Apples is that of Dr. H. V. TAYLOR, English Apples, published in 1936.

This contains full descriptions of many varieties, and shorter records of others, and is an attempt at a census of Apples grown in England to-day. Varieties which appear in current catalogues are specially noted, and it is thus a useful guide to the obtainable varieties as well as a reference to local sorts which are not obtainable as trees. Interesting chapters on Classification, History, Genetics of Apple Breeding, etc., preface the main body of the work.

When we turn to the cultural side of fruit growing, we find a much larger selection available, from the small sixpenny volumes up to works of larger scope. But even here we have to admit that pruning has never been very adequately treated in England—nothing comparable, for instance, to the Traité d'Arboriculture Fruitière of A. and G. RIVIÈRE (1928), with its detailed drawings and elaborate descriptions, has yet been published in this country.

On the other hand, we can rightly claim that for other methods of cultivation, spraying and pest control generally, we are far ahead of most foreign countries.

Let us take the cultural books in order of price, starting at the lowest.

For a beginner I recommend Fruit Growing for Amateurs, by H. H. THOMAS and J. GARDNER (Cassell, 1*s.* 6*d.*). The eleventh edition is dated 1934. In its 150 pages all hardy fruits are included, and it is hardly possible to imagine that better advice and illustrations could have been provided in so small a space.

Next we may place Fruit Growing, by the late T. W. SANDERS (7*s.* 6*d.*—but now, I think, available at a much lower price). Here we have a very fully illustrated work designed for the small garden, and the advice given, with a few exceptions, will be approved by all experts.

The most important cultural book on fruit published in recent years is The Fruit Garden, by GEORGE BUNYARD and OWEN THOMAS. This is out of print, but can often be obtained second-hand at about 25*s.* It is the only modern book which deals fully with the cultivation of fruit under glass as well as out of doors. Mr. OWEN THOMAS was for many years gardener at Windsor and had an unrivalled experience in this branch, and the outdoor fruits and descriptions of

varieties were dealt with by my father. This is the most recent work dealing with fruit culture for the large-scale garden.

The recent book by Sir FREDERICK KEEBLE and Mr. A. N. RAWES, Hardy Fruit Growing (Macmillans, 1936, 16s.), is perhaps designed more for the market fruit grower than for the amateur, but as it contains descriptions of the most modern methods of spraying and cultivation, together with some valuable chapters on the soil and principles generally, it will be consulted by the advanced amateur with profit.

Books on pruning alone, as I have said, are all too few, and it is perhaps impossible to produce a small cheap work on this subject.

The system advocated by the late M. LORETTE has attracted some interest in this country, and a translation of LORETTE'S own book by the late W. R. DYKES, The Lorette System of Pruning (Martin Hopkinson), was published in 1925. It must be said, however, that LORETTE'S own contribution to pruning methods occupies only a few pages, much of the rest being devoted to general methods common to all fruit growers.

VEGETABLES.

The literature of vegetables and their cultivation is by no means so extensive as that of fruit, and there are few large comprehensive books to refer to: probably our seed merchants think that they cater very amply for us in their wonderful seed catalogues.

Those who wish for a systematic treatment must turn to the classic Les Plantes Potagères, by the famous seedsmen of Paris, Messrs. VILMORIN-ANDRIEUX. The most recent edition is that of 1925 and contains 812 pages, with many coloured plates and hundreds of cuts.

This book shows all the different vegetables grown in France, and the range of varieties is truly astounding: eighteen pages are devoted to illustrating and describing Onions.

An English translation of an earlier edition of this work is obtainable and is entitled The Vegetable Garden. This has not the coloured plates of the last French edition. This work is valued for its descriptions.

On the cultural side we can usefully turn to Messrs. SUTTON'S The Culture of Vegetables and Flowers, 1936; The Profitable Culture of Vegetables, by THOMAS SMITH (Longmans, Green, 1919)—still an outstanding book; Vegetables for Home and Exhibition, by E. BECKETT (Simpkin, Marshall, 1927); Vegetables and their Cultivation, by T. W. SANDERS (Collingridge, 1928); and Vegetable Growing for Amateurs, by H. H. THOMAS (Cassell, 1921). There are also books on special Vegetables available, and a useful list of these is given in the Bibliography for the Amateur Gardener, published by our Society.

As most vegetables are grown for cooking purposes, it may be useful to note a few in this section. The Country Life Cookery Book, by AMBROSE HEATH (Country Life, 1937), and Lady MARTINEAU'S Cantaloup to Cabbage (Cobden Sanderson, 1929) can be recommended.



FIG. 3.—CONTROL TREE OF 'WESTMORLAND' DAMSON PRACTICALLY DEFOLIATED BY THE RED SPIDER MITE. SPRAYED TREE ON LEFT PARTLY RE-INFECTED BY DRIFT OF THE PEST DUE TO THE PREVAILING WIND.



FIG. 4.—THE ARROW INDICATES A 'CHESHIRE' DAMSON ALMOST UNAFFECTED BY RED SPIDER MITE, ACTING AS A CHECK TO THE DRIFT OF THE PEST TO THE 'WESTMORLAND' DAMSON ON THE RIGHT FROM THE BADLY AFFECTED 'WESTMORLAND' TREES ON THE LEFT.

[*To face p. 77.*

SPRAYING TRIALS AGAINST RED SPIDER MITE (*OLIGONYCHUS ULMI*) ON DAMSONS IN WESTMORLAND.

By R. A. HARPER GRAY, M.A., M.Sc., King's College, Newcastle-upon-Tyne, and H. E. BROOKS, N.D.H., Cumberland and Westmorland Farm School, Cumberland.

General.—The Damson-growing area in Westmorland is comparatively small, and probably does not exceed 150 acres, but the industry is of considerable local importance. Most of the orchards are in South Westmorland, the chief centre being the Lyth Valley and surrounding districts.

Some orchards have been properly laid out, but many of the trees are set in small irregular areas, and many are in hedges.

Soil and Climate.—Many of the orchards are on rather thin soils over limestone, but some are on shale, and some on the alluvial soils where the Lyth Valley merges into the flat low-lying land at the head of Morecambe Bay. The climate, on the whole, is mild and genial, but in some seasons spring frosts cause severe damage to the blossoms, and it is probably chiefly on this account that the 'Westmorland' Damson is regarded as an erratic cropper. That frosts are wholly the cause of crop failure is, however, doubtful, for old growers admit that after a heavy yield there are usually very light crops for one or two years, and this seems to indicate that " exhaustion is a contributory factor to a decline in yield."

The Trees and Varieties.—There is great diversity in the age and the condition of the trees. In some old orchards the trees have reached a height of 30 feet, with long bare trunks, which necessitates the use of ladders for picking the fruit, but there are others where the trees have been properly trained for the development of a good " head."

Practically all the Damson orchards consist of the 'Westmorland' Damson, the only other varieties occasionally found being one known locally as 'Blue Violet,' and another called by growers the 'Cheshire,' which, though flowering later, ripens earlier than the 'Westmorland' Damson.

Insect Pests.—Several insects or allied pests cause more or less serious damage to 'Westmorland' Damson trees, the chief noted being Aphides and the Red Spider Mite (*Oligonychus ulmi*), while in some years the Winter Moth and the Plum Sawfly (*Hoplocampa flava*) may cause loss of crop. The 'Westmorland' Damson appears to be particularly susceptible to attacks of the Red Spider Mite as compared with the 'Cheshire' Damson. On several occasions isolated trees of the 'Cheshire' have been found to be practically free from Red Spider Mite damage, although growing amongst groups of the 'Westmorland' Damsons showing serious infestation of the pest.

Spraying Trials.—Some years ago a few growers began winter spraying with tar-distillate washes on a small scale, but, though good control of Aphides was obtained, increasingly severe attacks of Red Spider occurred, and spraying was discontinued. Severe infestations of both Aphides and Red Spider Mites then recurred and the need for sprays to control these pests was therefore evident. In January 1933 a small plantation of young Damsons, available through the courtesy of Mr. H. MILLARD, Dodd's How, Crossthwaite, was sprayed with winter washes (tar distillates and white oils). Two of these gave good control of both Aphides and Red Spider Mite, but, unfortunately, trials repeated in 1934 and 1935 did not give consistently good results, and it was decided to carry out in 1936 fairly extensive trials which would include both winter and summer washes, the aim being to determine the comparative merits of winter and summer sprayings as well as to find an efficient commercial control against Red Spider Mite and Aphides. These trials also were carried out at Mr. MILLARD'S orchard on a good plantation of young Damson trees just coming into bearing.

The portion of the orchard selected sloped slightly and consisted of nine rows of seven trees planted eight yards apart each way, viz. :

NORTH

	Row	9	O	x	x	x	x	x	x
	,,	8	O	x	x	x	x	x	x
	,,	7	O	x	x	x	x	x	x
	,,	6	O	x	x	x	x	x	x
WEST	,,	5	O	x	x	x	x	x	x EAST
	,,	4	O	x	x	x	x	x	x
	,,	3	O	x	x	x	x	x	x
	,,	2	O	x	x	x	x	x	x
	,,	1	O	x	x	x	x	x	x

SOUTH

O = Control or unsprayed trees. The arrows indicate direction of the prevailing wind, which seemed to cause a " drift " of Red Spider Mites to the first few trees on the windward side of each control—a very noticeable feature in the trials (see fig. 3).

The first tree in each row was unsprayed, the remainder receiving proprietary washes of composition as stated below :

A. WINTER WASHES (applied Feb. 1936).

Row 1. A tar oil and petroleum oil emulsified—10 per cent.
,, 2. A petroleum winter wash—7½ per cent.
,, 3. Petroleum and high-boiling tar oils, emulsified—7½ per cent.
,, 4. Petroleum oil, " miscible emulsion " type—6 per cent.
,, 5. Petroleum oil, " concentrated emulsion " type—6 per cent.

B. SUMMER WASHES (applied June 1936).

Row 6. A colloidal sulphur—1 lb. to 20 gallons water.
,, 7. Lime sulphur with spreader—1 per cent.
,, 8. A petroleum wash for summer use—2 per cent.
,, 9. A refined white oil emulsion—2 per cent.

RESULTS.

A. *Winter Washes.*

Row 1.

As compared with other winter washes used this gave the most efficient control against the Red Spider Mite. A noticeable feature was an apparent "drift" of Red Spider Mites from the control tree on to the tree next to it, affecting to a less extent the next two trees. A tree to the west of the control tree (not in the trial, but sprayed with the same material), on the other hand, showed very little infestation. This re-infestation from the control trees was also very evident in other rows and is probably to be accounted for by the prevailing wind, as is indicated in the plan showing the arrangement of the trees.

Row 2.

Here the attack showed itself more quickly than in any of the other winter-sprayed trees, and, as a result, the foliage throughout was injured to such an extent by the end of July that Mr. MILLARD considered the loss of leaf then apparent sufficient to affect the crop seriously. The control tree showed very heavy infestation resulting in a marked absence of young growth.

Row 3.

The sprayed trees in this row contrasted well with the control when examined in July, the foliage as a whole having till then a healthy green appearance. The good effect of the wash, however, was only partial, as by the end of September the sprayed trees appeared almost as badly infested with Mites as was the control, and the crop was seriously affected. But it was noted that though Aphis was present on the control, none could be found on the leaves and shoots of sprayed trees examined.

Row 4.

The wash for this row gave unsatisfactory results, there being little difference in the infestation of the control tree as compared with that seen in the sprayed trees. We considered that results did not justify recommending this wash for the control of the Red Spider Mite.

Row 5.

Slightly better than Row 4. Aphides controlled, but not Red Spider Mite.

B. *Summer Washes.*

Rows 6, 7, 8 and 9 were sprayed under good weather conditions, on June 18, in which month the Red Spider Mite was observed to be active.

Row 6.

The colloidal sulphur was used for this row and was difficult to mix. The trees were much infested before the spray was applied, and there appeared to be little difference between the sprayed trees and the control when examined afterwards.

Row 7.

The lime sulphur wash gave good control. A 'Cheshire' Damson in the row showed practically no sign of attack from Red Spider Mite, and apparently checked the spread of the Mite to the 'Westmorland' Damson next to it on the windward side (see fig. 4).

Row 8.

The summer petroleum wash used in this row gave good results.

Row 9.

The wash applied here was effective against Red Spider Mite, the sprayed trees contrasting conspicuously with the control.

Conclusions.

(1) Summer spraying gave more efficient control than winter spraying against the Red Spider Mite.

(2) Of the winter washes a tar oil and petroleum oil emulsified gave the best results, and as, owing to pressure of work in summer, growers in Westmorland are more likely to favour winter spraying of their trees, such a wash can be recommended.

(3) Efficient control was obtained by a summer wash consisting of refined white oil emulsion (Row 9), while others, noticeably the lime sulphur wash, gave good control.

(4) The trials indicated that if trees in a row are left unsprayed there is danger of a partial re-infestation, presumably caused by a "drift" of Red Spider Mite in the direction of the prevailing wind.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1937.

Angraecum infundibulare, Low's var. A.M. November 9, 1937. The flower of this variety appears to be of larger size than that produced by the plant which came before the Committee in 1904, when a **F.C.C.** was awarded. A conspicuous feature is the large funnel-shaped labellum. The species is figured in the Botanical Magazine, tab. 8153. Exhibited by Messrs. Stuart Low, Jarvis Brook.

Athyrium filix-foemina unco-glomeratum. A.M. August 17, 1937. From Mr. Robert Bolton, Birdbrook, Essex. A very remarkable dwarf variety of the Lady Fern with moss-green fronds about 3 inches long, bearing delicately divided and curled pinnae and forming a compact, rounded tuft. This was one of the most distinct of the many varieties included in the large exhibit staged by Mr. Bolton on that day.

Brassocattleya × 'Marie-Marie' var. 'Perfection.' A.M. October 26, 1937. Obtained by crossing *Brassocattleya* × 'Ilene' with *Cattleya* × 'Clotho,' this hybrid bore two large and well-formed light rose-pink flowers, the wide labellum frilled at the margin and having an old-gold central area. Shown by Messrs. Black & Flory, Slough.

Brassolaeliocattleya × 'Cupid.' F.C.C. December 14, 1937. An elegant flower, of which two were borne on the spike. The segments are of firm texture, and the principal feature is the beautiful golden colour, the labellum having a ruby-crimson apex and shading of similar tint in the throat area. The result of crossing *Brassolaeliocattleya* × 'Golden Queen' with *Cattleya* × 'Bellona.' Exhibited by Messrs. McBean, Cooksbridge, Sussex.

Brassolaeliocattleya × 'Rosella.' A.M. November 30, 1937. A flower of firm texture and of an unusual colour, especially for a Brassavola hybrid, being almost uniform rich crimson-rose, the labellum having gold veining in the throat area. It results from the crossing of *Brassocattleya* × 'Rosita' with *Laeliocattleya* × 'Nella,' and was exhibited by Messrs. Stuart Low, Jarvis Brook, Sussex.

Brassolaeliocattleya × 'Victoria' var. coerulea. A.M. November 9, 1937. This charming hybrid was raised in the collection of Sir Jeremiah Colman, Bart., Gatton Park, Reigate. The robust plant carried two spikes, with 10 and 11 flowers, respectively. The colour is bright lavender-rose, while the labellum has a purplish outer zone and a yellow centre. The parents are *B.-l.-c.* × 'Antoinette' and *Cattleya* × 'Portia' var. *coerulea.*

Cattleya × 'Fred Sander' var. 'Imperia.' F.C.C. November 30, 1937. A flower of large size, and meritorious on account of the rich deep-purple in all the segments. The labellum has a frilled margin and an old-gold throat. Raised by crossing *Cattleya* × 'Fabia' with *C.* × 'Remy Chollet.' Exhibited by Messrs. Sanders, St. Albans.

Chrysanthemum 'Lilac Wonder.' **A.M.** December 14, 1937. From Messrs. Vinten, Balcombe. A medium-sized, silvery lilac-pink Japanese variety suitable for cutting and market. It was raised by Mr. T. Jeffries.

Cymbidium × 'Amelia' var. 'Solum.' **A.M.** November 9, 1937. A distinct hybrid, obtained by crossing *C. albanense* with *C.* × *erythrostylum*. The erect spike bore 7 flowers, with lines of dark spotting on the sepals and petals, the labellum heavily marked with blackish-crimson. Exhibited by Messrs. McBean, Cooksbridge.

Cymbidium × 'Lucy' var. 'Goldcrest.' **A.M.** November 30, 1937. This vigorous plant carried two arching spikes with twelve and fourteen flowers respectively, of a pleasing golden-green, the labellum lighter and marked with reddish spots. The result of crossing *Cymbidium* × 'Doris' with *C.* × 'Lucastes.' Exhibited by the Hon. H. S. Tufton, Castle Hill, Englefield Green.

Cymbidium × 'Lucy' var. 'Goldilocks.' **A.M.** November 30, 1937. An attractive hybrid which bore a spike of nine flowers, bright greenish-gold, the labellum spotted with red-brown. Exhibited by Messrs. McBean.

Cymbidium × 'Moirense' var. 'Diana Broughton.' **A.M.** November 9, 1937. This is the result of crossing *C. albanense* with *C.* × 'Moira,' and was exhibited by Capt. the Hon. H. R. Broughton, Bakeham House, Englefield Green, Surrey. The spike bore 9 flowers, greenish-buff with a golden sheen, the labellum marked with rich crimson.

Cypripedium × 'Constance Flory' var. 'Venus.' **A.M.** November 9, 1937. A pleasing flower of uniform rich honey-yellow colour, except for the white apex to the labellum. Raised by crossing *C.* × 'Doris Black' with *C.* × 'Symphony.' Shown by Messrs. Black & Flory.

Cypripedium × 'Diana Broughton' var. 'Alcestis.' **F.C.C.** December 14, 1937. A charming flower of model form. The broad petals, crisped at the upper margin, are honey-yellow, and the labellum is brighter yellow. The dorsal sepal is light green with a broad white marginal zone, and the ventral sepal is almost of similar size and coloration. A feature of the flower is the entire absence of spotting on any of the segments. *C.* × 'Doris Black' var. 'Venus' × *C.* × 'Grace Darling' var. 'Princess.' Exhibited by Capt. the Hon. H. R. Broughton, Bakeham House, Englefield Green, Surrey. See fig. 1.

Cypripedium × 'Diana Broughton' var. 'Diadem.' **A.M.** November 30, 1937. A pretty flower of model form, bright honey-yellow, the dorsal sepal having a whitish apex. The result of crossing *C.* × 'Doris Black' with *C.* × 'Grace Darling.' Exhibited by Capt. the Hon. H. R. Broughton.

Cypripedium × 'Leonora' var. 'Amaranth.' **A.M.** November 9, 1937. An elegant result obtained by crossing *C.* × 'Cardinal Mercier' with *C.* × 'Golden Eagle.' The dorsal sepal is mainly of deep rose and purple, while the labellum and petals are yellowish with red-brown shading. Exhibited by Messrs. H. G. Alexander, Tetbury.

Cypripedium × 'Sunset.' A.M. November 30, 1937. A handsome flower, in which the dorsal sepal is deep crimson-rose, with venation of a darker tint. Produced by crossing *Cypripedium* × 'Earl of Chester' with *C.* × *Maudiae*. Exhibited by Messrs. Sanders.

Gaultheria Wardii. A.M. November 7, 1933. From Lt.-Col. L. C. R. Messel, O.B.E., Handcross. A distinct and graceful species collected by Kingdon Ward under his number 7134. The arching stems reach a height of 2 or 3 feet and bear dark sage-green, elliptical-lanceolate, finely-toothed leaves covered while young with rust-coloured hairs. The tubular, white flowers are arranged in dense axillary racemes and are followed by dark blue berries covered with bloom.

Gentiana × 'Glendevon.' A.M. September 29, 1937. From Andrew Harley, Esq., Blinkbonny, Kirkcaldy. An interesting hybrid raised from the cross *G. ornata* × *G. sino-ornata*, with the close compact habit of *G. ornata*. The prostrate stems bear small, linear-lanceolate, dark-green leaves and terminal flowers of medium size and intense blue colour. A valuable addition to the list of Gentian hybrids.

Odontoglossum × 'Purple Crown.' A.M. November 30, 1937. This attractive hybrid bore a tall spike of eleven well-formed flowers, in colour magenta-purple, the sepals and petals having a narrow white margin, the labellum with a broader white margin. The result of crossing *Odontoglossum* × 'Imperator' with *O.* × 'Purple Queen.' Exhibited by Messrs. Charlesworth, Haywards Heath.

Odontonia × 'Carina.' A.M. November 9, 1937. This showy hybrid bore a spike of 10 flowers, which are rose coloured, with reddish-purple blotching. The wide labellum has a yellow crest. The result of crossing *Odontoglossum* × 'Camilla' with *Odontonia* × 'Duchess of York.' Exhibited by Messrs. Charlesworth.

Oncidium × Mantinii var. magnificum. A.M. October 26, 1937. Believed to be a natural hybrid between *O. Forbesii* and *O. Marshallianum*. The erect spike bore thirteen golden-yellow flowers, the sepals and petals blotched and spotted with red-brown. Shown by Messrs. Stuart Low.

Salvia fulgens. A.M. November 9, 1937. From Mr. R. C. Notcutt, Woodbridge. A most handsome herbaceous, or sometimes semi-shrubby, Mexican species. The tall growths branch freely, bearing large, stalked leaves rich green above and more or less white-tomentose beneath. The tubular scarlet flowers are carried in whorls of six on long, open racemes, which are freely developed until frost comes.

Vanda coerulea var. 'Queen Elizabeth.' F.C.C. October 26, 1937. This unusually fine variety carried an arching spike of thirteen large flowers, lavender-blue with darker venation. Shown by Messrs. H. G. Alexander.

DELPHINIUMS AT WISLEY, 1934–37.

THE following report of the trials of perennial Delphiniums at Wisley shows the Awards given from 1934 to 1937 after trial; the varieties which the Joint Committee of the Royal Horticultural Society and the Delphinium Society which acts as Judges considers to be superseded, and which are therefore discarded from the Collection; and the names of the varieties which now form the Standard Collection against which new varieties as they are selected for trial are judged.

The plants are grown in groups of three of a variety and have been judged without disbudding or thinning of the flower spikes.

The varieties are grouped in the report, first according to the type —Belladonna or Elatum—next according to whether the flowers are single, semi-double or double, then according to the colour group to which they belong, the colour group being fixed by the general appearance of the variety in the garden.

The report thus serves to indicate the varieties which in the opinion of the Joint Committee are the pick of those now available for garden decoration.

DESCRIPTIONS, AWARDS, AND NOTES.

Belladonna Type.

Flowers White.

Moerheimii, A.M. June 22, 1935.—See JOURNAL R.H.S., **59**, p. 166. [**H.C.** 1933.]

Flowers Pale Blue.

Blue Bees (introduced by Messrs. Bees and sent by Messrs. Blackmore & Langdon of Bath). **A.M.** June 22, 1935, for cutting and garden.—3½ feet; spikes 8 to 11 inches long; side spikes many; flowers 1½ inch, pale forget-me-not blue; eye small, bluish.

Musis Sacrum (sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—See JOURNAL R.H.S., **51**, p. 124.

Varieties retained: BELLADONNA SEMIPLENUM (**A.M.** 1933), NASSAU (**H.C.** 1925), PERSIMMON (**H.C.** 1925), FANNY STORMOUTH.
Varieties discarded: BELLADONNA GRANDIFLORA, CAPTIVANT (**H.C.** 1933).

Flowers Dark Blue.

Eye light.

Orion (raised by Mr. F. Koppius, sent by Messrs. Bakers of Codsall, Wolverhampton). **A.M.** June 26, 1937.—See JOURNAL R.H.S., **59**, p. 167. [**H.C.** 1933.]



FIG. 5.—CRATAEGO-MESPILUS GRANDIFLORA AT WISLEY, MAY 1937.

[*To face p.* 84.



FIG. 6.—IN THE ROCK GARDEN, WISLEY, MAY 1937.

Lamartine (sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—See JOURNAL R.H.S., **51**, p. 125. [**H.C.** 1925.]

Variety retained : MRS. J. S. BRUNTON (**A.M.** 1925).
Varieties discarded : ELSTEAD BLUE, SKY BLUE.

Eye dark.

Naples (raised by Messrs. Ruys, sent by Mr. G. Wood, Ashtead). **A.M.** June 29, 1935.—3 feet ; spikes 9 to 15 inches long ; side spikes many ; flowers 2 inches, rich gentian blue with a faint mauve flush ; eye small, purplish blue.

Barwick Gem, A.M. June 22, 1935.—See JOURNAL R.H.S., **59**, p. 167.

Varieties retained : ISIS (**A.M.** 1933), MRS. THOMSON (**A.M.** 1925), THEODORA (**A.M.** 1933).
Varieties discarded : ESTEREL, HORATIUS (**H.C.** 1933).

Elatum Type.

SINGLE.

Flowers White.

Variety discarded : ELATUM.

Flowers Pale Blue.

Eye light.

Blue Danube (raised and sent by Messrs. Hewitt of Stratford-on-Avon). **A.M.** July 5, 1935.—7 feet ; spike 20 to 30 inches long ; side spikes many, strong ; flowers 2¼ to 2½ inches, bright forget-me-not blue with a delicate pale pinkish-mauve flush ; eye small, pale buff.

Varieties retained : MRS. TOWNLEY PARKER (**A.M.** 1933), BLUE PRINCESS (**A.M.** 1925)
Varieties discarded : BLUE BELLS, AFGHAN QUEEN, ANNE HATHAWAY, CHRISTINE KELWAY, KELWAY'S SUPERB, SISTER CLARE (**A.M.** 1925).

Eye dark.

Wrexham Dandy Boy (raised and sent by Mr. Watkin Samuel of Wrexham). **A.M.** June 26, 1937.—7½ feet ; spikes tapering, 2 to 3 feet long ; side shoots few, strong ; flowers 2¾ inches, pale forget-me-not blue, flushed pale pink ; eye small, light brown.

Varieties discarded : ANGEL EYES, BLUE QUEEN (**A.M.** 1920), QUEEN OF BATH, MRS. R. E. DOCWRA, SKY BLUE KNIGHT.

Flowers Dark Blue.

Eye light.

Evelyn Richie (raised and sent by Messrs. Bakers). **H.C.** June 26, 1937.—6 feet ; spike somewhat tapering, 20–36 inches long ; side spikes of medium strength ; flowers 2⅜ inches, deep rich forget-me-not blue ; eye small, white and mauve.

Varieties retained : BLUE BOY (**A.M.** 1925), CONSTANCE (**A.M.** 1925), MRS. LLOYD EDWARDS.

Varieties discarded: COLONEL DOUGLAS, JOHAN (A.M. 1925), LADY RAVENSWORTH, LORD LANSDOWNE, TOBOGGAN.

Eye dark.

Lady Janet (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—5½ feet, spikes tapering, 1½ to 2½ feet long; side spikes few; flowers 2½ inches, clear light gentian-blue; faintly tinged pinkish-mauve; eye small, black.

Blue Beauty (raised and sent by Mr. Watkin Samuel). **A.M.** June 29, 1935.—6 feet; spike 20 to 30 inches long, symmetrical; side spikes few, strong; flowers 2½ inches, azure-blue, faintly flushed pale mauve; eye small, black.

Kelway's Premier (raised and sent by Messrs. Kelway of Langport). **H.C.** June 22, 1935.—5 feet; spikes 15 to 18 inches long; side spikes many; flowers 2 to 2½ inches, rich gentian blue; eye blackish.

Varieties retained: WREXHAM GLORY, WREXHAM BRIDE.
Varieties discarded: HIS MAJESTY, KNIGHT OF LANGPORT, LADY AUGUSTA, KELWAY'S PREMIER (discarded 1937).

Flowers Pale Mauve.

Variety discarded: VAN VEEN'S TRIUMPH.

Flowers Blue and Mauve.

Wild Wales (raised and sent by Mr. Watkin Samuel). **A.M.** June 22, 1935.—5 feet; spike 18 to 24 inches long; side spikes medium, strong; flowers 3 inches, deep forget-me-not blue, margins broadly tinged pinkish-mauve; eye small, black.

Mrs. Pitts (raised and sent by Messrs. Bakers). **H.C.** June 22, 1935.—6 feet; spike 18 to 24 inches long; side spikes medium, strong; flowers 1¾ inch, forget-me-not blue, tips of petals tinged mauve; eye small, white.

Variety retained: ANN BAKER (A.M. 1930).
Varieties discarded: ACHILLES, BUTTERFLY, COL. SIR WYNDHAM MURRAY (A.M. 1925), QUEEN OF THE SKY, MRS. BERKART, WREXHAM (H.C. 1925), MRS. PITTS (H.C. 1935, discarded 1937), HAPPINESS, MRS. W. WELLS.

Flowers Violet and Purple.

Varieties retained: THE BISHOP, VIOLET QUEEN (A.M. 1933).
Varieties discarded: HENRI MOISSAU, GEORGE MOORE.

SEMI-DOUBLE.

Flowers White.

Varieties retained; PRIMROSE, PUDOR'S WHITE.

Flowers Pale Blue.

Eye light.

Clarissa (raised and sent by Mr. T. Bones of Cheshunt). **A.M.** June 22, 1935, as a cut flower.—5 feet. Spike 18 to 26 inches long;

side spikes few; flowers 2 inches, bright forget-me-not blue, inner petals tinged pale mauve at tips; eye small.

Lady Holt (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—5 feet. Spike tapering, 1½ to 2 feet; side spikes many, strong; flowers 2¼ inches, bright forget-me-not blue, inner petals faintly tinged mauve at tips; eye white.

Variety retained: QUEEN OF HEARTS.
Varieties discarded: LADY H. BOWLES, KATE GREENAWAY, QUEEN MARY.

Eye dark.

Varieties retained: LADY EMSLEY CARR (**A.M.** 1933), DAYDREAM.
Varieties discarded: LADY IRENE, PRINCESS MARY.

Flowers Dark Blue.

Eye light.

A. J. Moir (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—6 feet. Spike 24 to 30 inches; side spikes very many, strong; flowers 2½ inches, bright sapphire-blue, at eye tinged mauve; eye small.

Lilian Bishop (raised and sent by F. A. Bishop, Esq., of Windsor). **A.M.** June 29, 1935.—5 feet. Spike 18 to 22 inches; side spikes many, strong; flowers 2¼ inches, bright gentian-blue, inner flushed mauve; eye small. Resistant to mildew.

Italia (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—See JOURNAL R.H.S., **60**, p. 419. 7 feet; side spikes many.

Welsh Beauty (raised and sent by Mr. Watkin Samuel). **H.C.** June 26, 1937.—6½ feet. Spike tapering, 2 to 3 feet long; side spikes strong; flowers 2½ inches, rich clear azure-blue, inner petals flushed light purplish-mauve; eye small, white.

Variety retained: F. W. SMITH (**H.C.** 1933).
Varieties discarded: HUGH MITCHELL (**A.M.** 1925), MRS. S. B. TUCKER.

Eye dark.

Blue Gown, F.C.C. June 29, 1935.—See JOURNAL R.H.S., **59**, p. 168. [**A.M.** 1933.]

St. George (raised and sent by Messrs. Hewitt). **A.M.** June 22, 1935.—6 feet. Spike 15 to 18 inches; side spikes strong; flowers 2¼ inches, rich gentian-blue self; eye large.

Romeo (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—6 feet. Spike 18 to 24 inches; side spikes few, strong; flowers 2¼ inches, gentian-blue, light mauve flush; eye small.

Blue Spire (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—7 feet. Spike tapering, 2 to 3 feet long; side spikes strong; flowers 2 inches, closely set, rich forget-me-not blue with a faint mauve tinge; eye small, pale brown. [**H.C.** 1935.]

Welcome (raised and sent by Mr. Watkin Samuel). **A.M.** June 26, 1937.—5½ feet. Spikes somewhat tapering with closely arranged

flowers, 1½ to 2 feet long; side spikes few, weak; flowers 2¼ inches, bright clear azure-blue, inner flushed pinkish-mauve; eye small, light brown.

Lucretia (raised and sent by Messrs. Blackmore & Langdon). **H.C.** June 26, 1937.—5 feet. Spike tapering, 1½ to 2 feet long; side spikes strong; flowers 2½ inches, rich gentian-blue; eye dark brown.

Variety retained: MOZART.
Varieties discarded: CORRY (**A.M.** 1925), CARRIE (**H.C.** 1925), C. W. MATTHES, WELSH WONDER.

Flowers Mauve.

Eye light.

Lady Clara (raised and sent by Messrs. Blackmore & Langdon). **A.M.** July 5, 1935.—7 feet; spike 24 to 30 inches long; side spikes strong; flowers 2¼ inches, delicate pale mauve outer petals with a faint pale sky-blue flush; eye large.

Lady Guinevere (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—6½ feet. Spike 24 to 32 inches long; side spikes many, strong; flowers 2½ inches, pale pinkish mauve, centre of petals pale forget-me-not blue; eye small.

Varieties retained: LADY MAY, MRS. SHIRLEY (**A.M.** 1933).
Varieties discarded: GLORY (**H.C.** 1925), LORD OF JUNE.

Eye dark.

Lady Bertha (raised and sent by Messrs. Blackmore & Langdon). **A.M.** July 5, 1935.—6 feet. Spike 18 to 24 inches; side spikes many, strong; flowers 2½ inches, pale mauve self; eye large.

B. M. Gurteen (raised and sent by H. A. Perkins, Esq., of Bognor Regis). **H.C.** June 26, 1937.—8 feet. Spike tapering, 2 to 3 feet long; side spikes few, strong; flowers 2¾ inches, pale mauve, outer petals tinged pale blue; eye dark brown and mauve.

Variety retained: LADY EDITH.
Variety discarded: BARBARA LLOYD.

Flowers Pale Blue and Pale Mauve shades.

Eye light.

Lady Eleanor, F.C.C. June 29, 1935.—See JOURNAL R.H.S., **59**, p. 168. [**A.M.** 1933.]

Lady Barbara, A.M. June 29, 1935.—See JOURNAL R.H.S., **59**, p. 169.

Lady Diana (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 29, 1935.—7½ feet. Spike 24 to 30 inches, side spikes strong; flowers 2¼ inches, very pale sky-blue, tinged pale mauve; inner pale pinkish-mauve.

Lady Kathleen (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 29, 1935.—7 feet. Spike 24 to 30 inches; side spikes few, strong; flowers 2 to 2¼ inches, pale sky-blue, inner pale mauve.



FIG. 7.—PRIMULA DENTICULATA IN THE WILD GARDEN, WISLEY, 1937.

[*To face p.* 88.

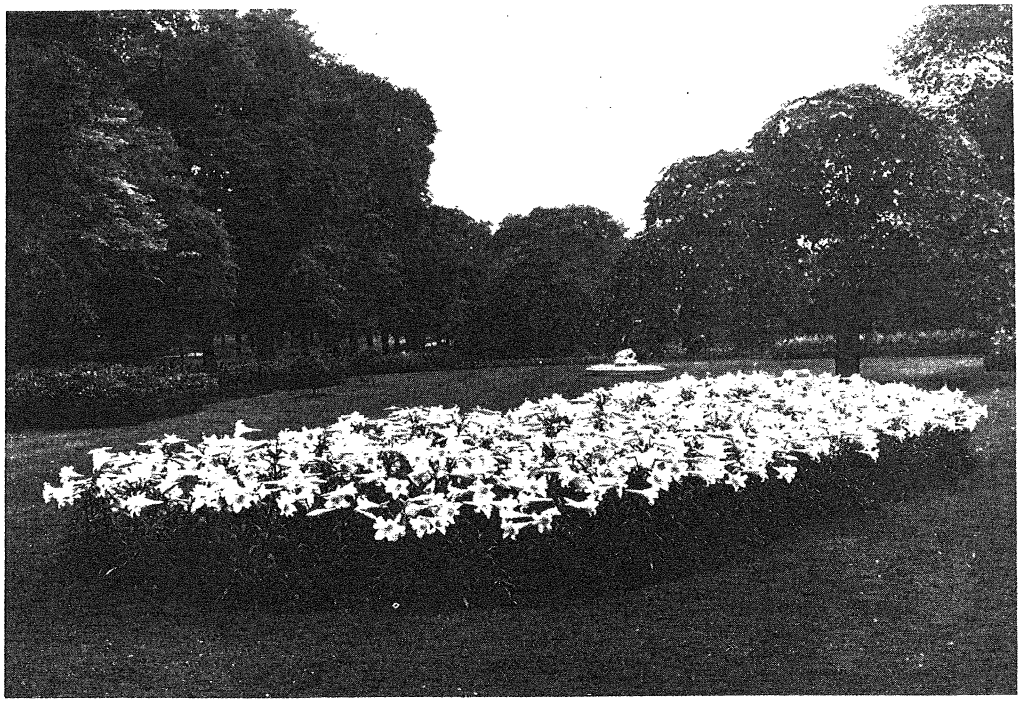


FIG. 8.—LILIUM LONGIFLORUM IN HYDE PARK, 1937.

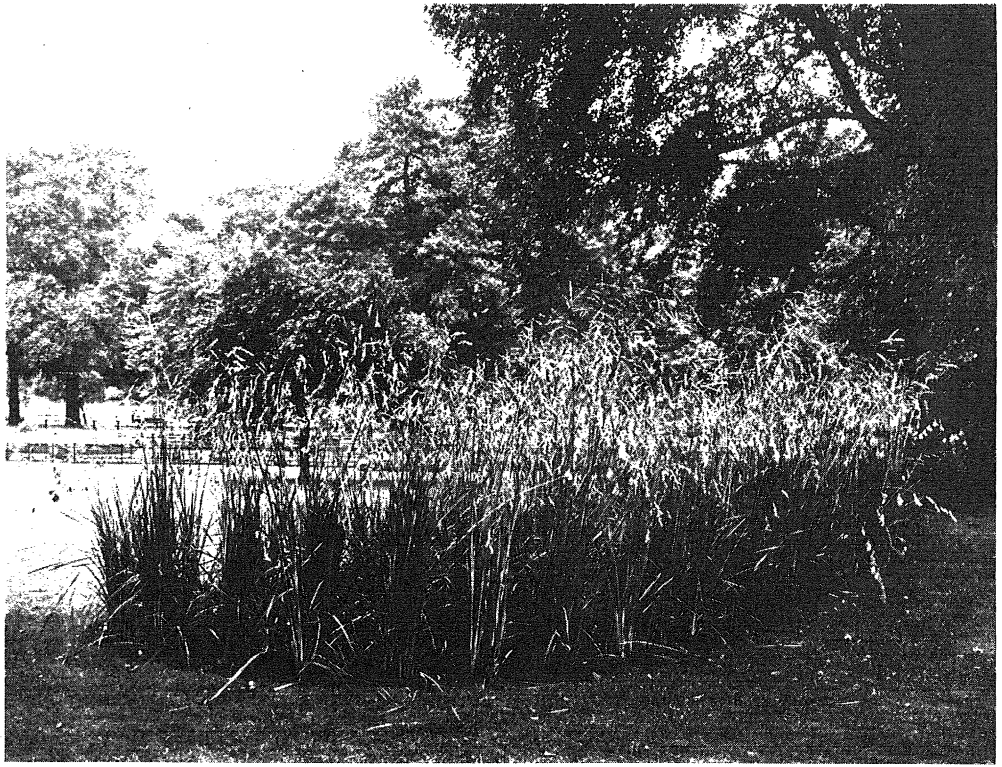


FIG. 9.—DIERAMA PULCHERRIMUM IN HYDE PARK, 1937.
(p. 93)

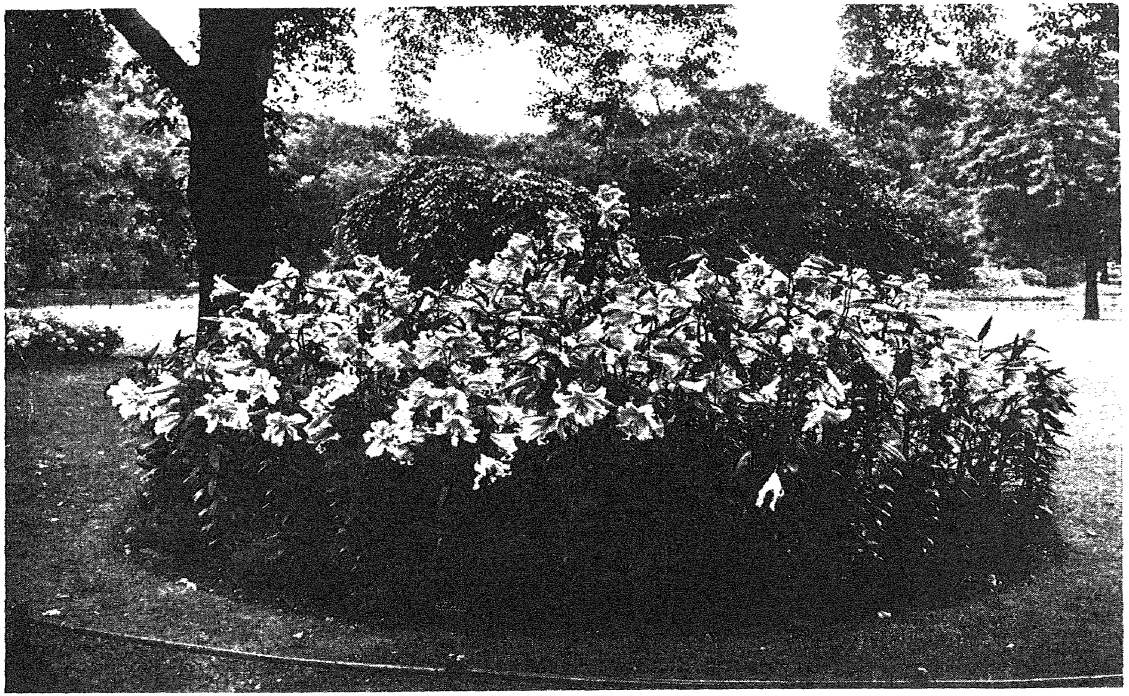


FIG. 10.—LILIUM AURATUM PLATYPHYLLUM IN HYDE PARK, 1937.

(p. 93)

[*To face p.* 89.

Laura Fairbrother (raised by Messrs. Blackmore & Langdon). **A.M.** July 5, 1935.—8 feet. Spike 24 to 30 inches; side spikes many, strong; flowers 2¼ to 2½ inches, sky-blue flushed pale mauve, inner pale pinkish-mauve.

Mrs. G. D. Gold (raised and sent by Mr. H. Robinson of Hinckley). **A.M.** July 5, 1935.—6 feet. Spike 20 to 30 inches; side spikes few, strong; flowers 2¼ to 2½ inches, sky-blue, inner delicate pinkish-mauve; eye large, buff.

Mrs. Hargreaves (raised and sent by Mr. T. Bones). **A.M.** June 26, 1937.—6 feet. Spike 18 to 24 inches; side spikes few, strong; flowers 2¼ inches, pale sky-blue, inner pale pinkish-mauve; eye small. [**H.C.** 1935.]

Hunsdon Dell (raised by Mr. T. Bones and sent by Messrs. Bakers). **H.C.** July 5, 1935.—6 feet. Spike 18 to 22 inches; side spikes strong; flowers 2¼ inches, forget-me-not blue, inner petals lightly flushed pale mauve; eye small.

Viscountess Harcourt (raised and sent by Messrs. Blackmore & Langdon). **H.C.** June 29, 1935.—5½ feet. Spike 18 to 26 inches; side spikes many, strong; flowers 2¼ to 2½ inches, pale sky-blue tinged pale pinkish-mauve; eye large.

Varieties retained: DORIS, EILEEN MAY ROBINSON, ELEGANCE (**H.C.** 1925), FRANCES, GEORGE RIVETT, HUNSDON DELL (**H.C.** 1935), JACK SALMON, KATHLEEN VAUGHAN, MARJORIE FERGUSON (**A.M.** 1925), MRS. EDMUNDSON (**A.M.** 1933), NORA FERGUSON (**A.M.** 1933), PRINCESS MARGARET ROSE, QUEEN OF THE BELGIANS (**A.M.** 1933), SCHUBERT, VERDI.

Varieties discarded: ARIEL (**A.M.** 1933), BEAU SABREUR, BLUE STAR, CEPHALLINA, DAINTY (**H.C.** 1925), FREDA, GLENCOE, H. LOVELL, JULIET, LORENZO DE MEDICI (**A.M.** 1933), HEWITT'S SUPERB, JEAN (**A.M.** 1925), MRS. J. S. COURTAULD, NANCY BANNISTER.

Eye dark.

Mrs. Newton Lees, F.C.C. June 29, 1935.—See JOURNAL R.H.S., **59**, p. 169. [**A.M.** 1933.]

Lady Dorothy (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 29, 1935.—7 feet; spike 18 to 24 inches; side spikes few, strong; flowers 2¼ to 2½ inches, forget-me-not blue, inner pale pinkish-mauve zoned pale blue at eye; eye large, black.

Robbie (raised and sent by Messrs. Blackmore & Langdon). **A.M.** July 5, 1935.—6½ feet. Spike 24 to 30 inches; side spikes few, strong; flowers flat, 2½ inches, pale sky-blue, inner petals pale pinkish-mauve; eye large, brown.

Charles Green (raised and sent by Mr. H. Robinson). **A.M.** June 26, 1937.—6 feet. Spike tapering, 20 to 30 inches long; side spikes few, strong; flowers 2½ inches, very pale sky-blue flushed pale mauve, inner delicate mauve; eye large, dark brown.

Lady Elizabeth (raised and sent by Messrs. Blackmore & Langdon). **H.C.** June 26, 1937.—6 feet; spike tapering, 1½ to 2 feet long; side spikes few, strong; flowers flat, 2¼ inches, Cambridge blue, inner petals pale mauve; eye large, brown.

Sonia Hotblack (raised and sent by H. S. Hotblack, Esq., of Cuckfield). **H.C.** June 26, 1937.—5½ feet. Spike tapering, 20 to 30 inches long; side spikes few, strong; flowers 2½ inches, rich clear forget-me-not blue, flushed pinkish-mauve; eye large, dark brown.

Varieties retained: CAMBRIA (**A.M.** 1930), DAWN (**A.M.** 1933), GOUNOD, JOHN PITTS, LADY JOAN, MILLICENT BLACKMORE (**A.M.** 1925), MRS. FOSTER CUNLIFFE, PUCCINI, ST. CATHERINE.

Varieties discarded: ASCOT, BELLE OF SOMERSET, CECILIA (**H.C.** 1925), GWEN, KITTY WARDELL, NETTY, DEIRDRE, DERBYSHIRE (**H.C.** 1925), GENIUS, POWERFUL, QUEEN OF JULY, QUEEN OF SPANGLES, MRS. A. J. WATSON (**A.M.** 1925).

Flowers Dark Blue and Mauve shades.

Eye light.

F. W. Smith, A.M. June 29, 1935.—See JOURNAL R.H.S., **59**, p. 170. [**H.C.** 1933.]

Betty Wells (raised and sent by Messrs. Wells, jun. of Merstham). **A.M.** June 26, 1937.—4½ feet. Spike blunt, 18 to 22 inches; side spikes few, strong; flowers 2½ inches, very closely arranged, pale gentian-blue flushed mauve, inner petals mauve; eye small, white. [**H.C.** 1935.]

Donald Allan (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—5½ feet; spike slightly tapering, 18 to 26 inches long; side spikes few, strong; flowers 2¼ inches, gentian-blue lightly flushed mauve; eye small, white.

Duchess of Portland (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—7 feet; spike tapering, 1½ to 2 feet long; side spikes few, strong; flowers 2½ inches, rich deep gentian-blue, inner petals flushed deep mauve; eye white.

Lady Rose (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—6 feet. Spike tapering, 22 to 30 inches long; side spikes many, strong; flowers rounded, basin-shaped, 2¼ inches, outer petals rich azure-blue, inner deep mauve lightly tinged at margins azure-blue; eye white. [**H.C.** 1935.]

Madge (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—5½ feet. Spike full, tapering, 1½ to 2½ feet long; side spikes few, weak; flowers forget-me-not blue, inner petals light pinkish-mauve; eye very small, white.

Excalibur (raised and sent by Messrs. Blackmore & Langdon). **H.C.** June 29, 1935.—6½ feet. Spike 18 to 28 inches; side spikes of medium strength; flowers 2 to 2¼ inches, rich gentian-blue flushed purple; eye white and pale purple.

Varieties retained: D. B. CRANE (**A.M.** 1933), DR. JAMES BLACK, DREAMS, GRAY LADY, JOY BELLS, PHILIP BUTLER (**A.M.** 1933), MASSENET, MONARCH OF WALES (**A.M.** 1925), MRS. COLIN MCIVER (**A.M.** 1925).

Varieties discarded: ADVANCEMENT, DAVID (**H.C.** 1933), EXCALIBUR (**H.C.** 1935, discarded 1937), MRS. W. L. WHINERAY, PANNONIA (**H.C.** 1925), RT. HON. MRS. MCKERRELL BROWN, THE ALAKE.

Eye dark.

Will Shakespeare (raised and sent by Messrs. Hewitt). **H.C.** June 29, 1935.—7 feet. Spike 24 to 36 inches long; side spikes few, strong; flowers 2¼ inches, azure-blue, inner petals mauve; eye pale brown.

Pompadour (raised and sent by Messrs. Hewitt). **A.M.** June 26, 1937.—6 feet. Spike tapering, 2 to 3 feet long; side spikes many, strong; flowers 2½ inches, gentian-blue, inner petals tinged mauve; eye creamy-buff.

Charming (raised and sent by Mr. Watkin Samuel). **H.C.** June 26, 1937.—5½ feet. Spike somewhat tapering, 18 to 26 inches long; side spikes strong; flowers 2⅜ inches, rounded, forget-me-not blue flushed pinkish-mauve; eye dark brown.

Lady Sue (raised and sent by Messrs. Blackmore & Langdon). **H.C.** June 26, 1937.—4½ feet. Spike slightly tapering, 1½ to 2½ feet long; side spikes few, strong; flowers 2⅓ inches, rich gentian-blue flushed purplish-mauve; eye small, deep brown.

Weber (raised and sent by Messrs. Hewitt). **H.C.** June 26, 1937.—6½ feet. Spike somewhat tapering, 20 to 36 inches long; side spikes few, weak; flowers 2¼ inches, bright gentian-blue, inner petals purplish-mauve tinged gentian-blue; eye small, brown.

Varieties retained: ADMIRATION (**A.M.** 1925), AFTERGLOW, DUCHESS OF YORK, LADY MARGARET, OMEGA, PORTHOS, PRINCESS ELIZABETH, ROSE MARIE (**A.M.** 1933), SEEDLING No. 4 (SYKES), THE SHAH (**H.C.** 1925), MARY WELLS.
Varieties discarded: REV. CHARLES STORR, LAURENT, NORA PHILLIPS, STANLEY.

Flowers Purplish-mauve.

Randolph (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 26, 1937.—6½ feet. Spike tapering, 20 to 30 inches long; side spikes few, strong; flowers 2¼ inches, gentian-blue flushed purplish-mauve, inner petals purplish-mauve; eye white, banded purplish-mauve.

Elizabeth Rickett (raised and sent by H. R. N. Rickett, Esq., of Worplesdon Hill, Woking). **A.M.** June 26, 1937.—5 feet. Spike somewhat tapering, 2 to 3 feet long; side spikes few, strong; flowers 2½ inches, rich gentian-blue, inner purplish-mauve; eye large rosette, dark brown.

Gerald Howse (raised and sent by Messrs. Blackmore & Langdon). **A.M.** July 5, 1935.—6 feet. Spike 20 to 30 inches; side spikes many, strong; flowers 2½ inches, purplish-mauve; eye brown.

Varieties retained: GEORGE COCHRANE, LORD DERBY (**A.M.** 1925), SATAN.
Varieties discarded: RUBY WELLS, RYNSTROOM, EVENING, MRS. PHILIP RUNCIMAN, PURPLE EMPEROR (**H.C.** 1925), PURPLE KING.

Flowers Violet and Purple shades.

Eye light.

Violet Robinson (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—5 feet. Spike 20 to 30 inches; side spikes

many, strong; flowers 2½ to 2¾ inches, violet tinged purple, inner petals rich violet-purple; eye large.

Varieties retained: EMPEROR (**H.C.** 1933), GRAHAM SETON, SIR DOUGLAS HAIG, VIOLET ROBINSON (**A.M.** 1935), REV. E. LASCELLES (**A.M.** 1933), TWILIGHT (**H.C.** 1933), WALES.

Varieties discarded: DARK LANTERN, GLORY OF THE GARDEN, LADY MACBETH, LANGPORT CROSS, RICH AND RARE, SVEN RIDDER, FRANÇOIS NAGELS, KING OF DELPHINIUMS (**A.M.** 1925), WALTER T. WARE (**A.M.** 1925).

Eye dark.

Lady Amy (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 22, 1935.—6 feet. Spike 16 to 22 inches; side spikes many, strong; flowers 2¼ inches, violet-purple, tips of outer petals azure-blue; eye large.

Sir Neville Pearson (raised and sent by Messrs. Blackmore & Langdon). **A.M.** June 29, 1935.—6 feet. Spike 24 to 30 inches; side spikes of medium strength; flowers 2½ to 3 inches, light gentian-blue, inner petals purple; eye large.

Welsh Boy (raised by Mr. Watkin Samuel and sent by Messrs. Bakers). **H.C.** June 29, 1935.—6½ feet. Spike 20 to 26 inches; side spikes few, strong; flowers 2½ inches, gentian-blue flushed deep mauve, inner petals purple; eye small.

Varieties discarded: DUSKY MONARCH, DUSKY QUEEN, MRS. TIPPITTS.

DOUBLE.

The following varieties were included in the trial and are retained

DOUBLE (Hill).
KING BLADUD.
LADY BATH.
LADY BETTY.
PRIDE OF WALES.



FIG. 11.—SABBATIA CHLOROIDES IN HYDE PARK, 1937.

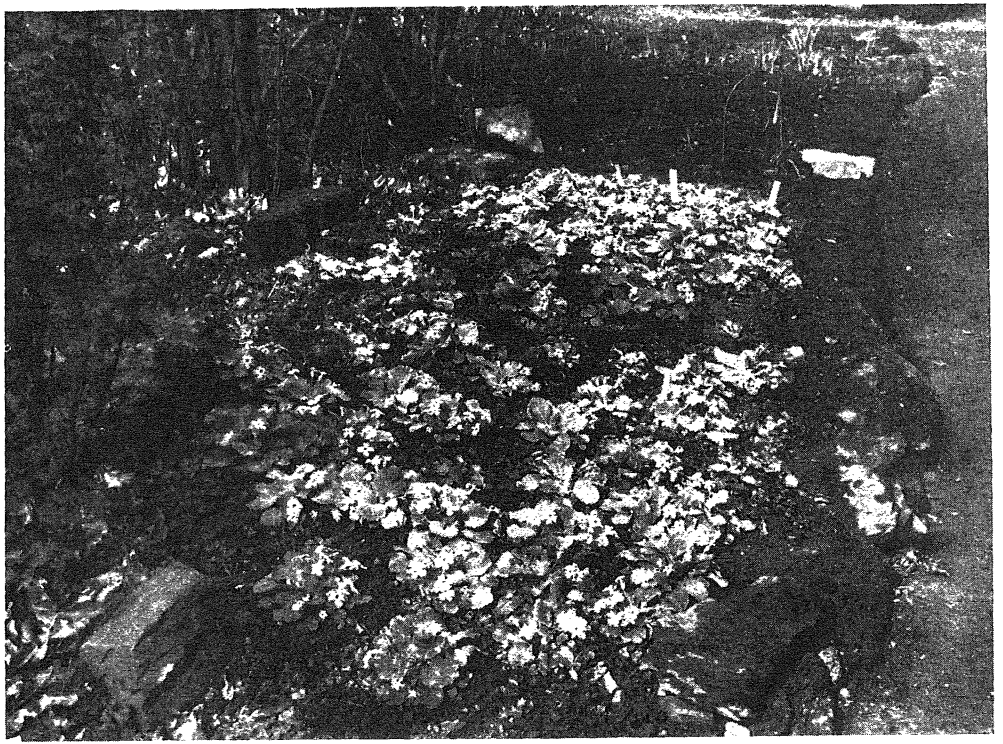


FIG. 12.—PRIMULA WINTERI AT THE MANOR HOUSE, TAVISTOCK.

[*To face p.* 93.

GARDEN NOTES.

Dierama pulcherrimum.—The wish to have a bed of this striking plant in Hyde Park presented some difficulty. The plants resent disturbance at the root and the usual method of planting them small and waiting patiently for two or three years for a display of flowers could not be entertained.

The difficulty was got over by planting several seedlings in small wire baskets, plunging the baskets in the Park nursery, and when the plants had formed good specimens with many flower stems the baskets were dug up and taken to the Park, where they were a great attraction for several weeks (fig. 9).

When the flowers had faded the plants were returned to their old spot in the nursery and showed no signs of distress ; they look promising enough to expect that they can make this visit to the Park an annual one.—*T. Hay, Hyde Park.*

Lilium auratum var. platyphyllum.—About ten species of Lilies are used for Park decoration. These ten all conform to pot cultivation with ease and safety and are planted out when sufficient growth has been made to furnish a bed (fig. 10).

L. auratum var. *platyphyllum* is preferred to *L. auratum* itself. It is less tall and not so easily damaged by wind. It may be thought that it is less graceful and elegant in formation than *L. auratum*, but imported bulbs of the variety *platyphyllum* are generally more healthy and free from disease than those of the type.

There are few plants more admired by the general public than this magnificent Lily, which is grown to perfection in many a London garden.—*T. Hay, Hyde Park.*

Sabbatia chloroides.—The Sabbatias are not nearly so popular as their merits deserve, but it can be admitted that there are many plants more easy to grow. In the early stages they are slow to exasperation, as at the end of their first year from seed the plants are no larger than a florin ; in the second year, however, they make rapid progress and a single plant will fill a five-inch pot and produce hundreds of flowers.

The illustration (fig. 11) shows a bed in Hyde Park that was very much admired and which brought many inquiries both from home enthusiasts and foreign visitors.

The Sabbatias are marsh plants confined to North America and Canada. *S. chloroides* is probably the best species.

Briefly, our plant may be described as a dwarf perennial, with narrow leaves three inches in length, stems slightly triangular, reaching to a height of eighteen inches ; flowers rose-pink nearly two

inches across and produced in great profusion over nearly three months. Seed should be sown in early spring and cold frame treatment given throughout.—*T. Hay, Hyde Park.*

Flowering of Bamboos.—Although references have been made in horticultural papers to the recent flowering of *Phyllostachys aurea* and *P. nigra*, I have not noticed any mention of a similar phenomenon in *Arundinaria Falconeri*. This Bamboo has always been grown at Birr Castle as *A. nobilis*, a name which was first proposed by the late Lord REDESDALE in The Bamboo Garden in 1896. On the grounds that there were two separate species under the name of *A. Falconeri* growing at Menabilly in Cornwall, he identified the smaller and tenderer of the two as the true *A. Falconeri*, and the larger and hardier plant he described as a new species under the name of *A. nobilis*. The late Dr. STAPF, however, in his description of *A. Falconeri* in the Bot. Mag. (tab. 7947), and in an article in the Gardeners' Chronicle of May 14, 1904, proves conclusively that Lord REDESDALE'S *A. Falconeri* is really *A. falcata*, and his *A. nobilis* the true *A. Falconeri*.

The three large clumps which were growing at Birr Castle were undoubtedly *A. Falconeri*, as they agreed perfectly with Dr. STAPF'S description. These plants were given to my father some time before the Great War by Sir CHARLES BARRINGTON, who has been kind enough to send me some interesting information on the subject. The original plants were given to his grandfather, Sir MATTHEW BARRINGTON, in the late forties of last century by an East India merchant of Dublin. They were planted at Glenstal, in Co. Limerick, and flowered and seeded in 1875. Seedlings were raised, and these in their turn flowered and seeded in 1905. My three plants were products of this later seeding, and duly flowered and seeded in 1935 and again in 1936, and I have raised seedlings of each year. Unfortunately Sir CHARLES BARRINGTON himself no longer had any plants of this species, as he finds it impossible to grow any Bamboos but the very hardiest in his present garden in Hampshire.

Although this particular strain of *A. Falconeri* appears to flower at strictly regular intervals of thirty years, the flowering period of the species in general seems to be spread in Europe over a period of four or five years, having extended through the years 1872–77 and 1903–5. Unfortunately I can find no reference to any date at which it has flowered in its home in the Himalayas, but it should be possible to obtain information about this latest seeding, if it has also taken place there.

A. Falconeri is one of the most beautiful of all Bamboos which can be grown in this country. It is similar in general appearance to *A. nitida*, but the leaves are of a paler green, the canes attain a great height, reaching to about 25 feet, and the habit is even more graceful. Unfortunately it is very much more tender, but it deserves to be grown in all gardens in the milder parts of the British Isles.

I should like to record also the flowering last summer of a variety of *Phyllostachys aurea*. There were five plants growing within a few yards of a large group of the type, and so distinct were they in general appearance, having leaves of a brighter green and a far more open weeping habit, that I had always imagined them to represent a distinct species. But Dr. Fox, who very kindly examined material I brought over, tells me that he cannot distinguish it botanically from the type, and that it must be a variety, differing merely in habit. I hope to be successful in raising seedlings, and it will be interesting to see whether they retain their character or revert. The plants were probably obtained from Japan by my father about twenty-five years ago. The flowering of this species also seems to be spread over a number of years, as a plant of the type flowered with me in 1935, while I hear it is commencing to flower in Italy this year, and I have another plant myself which as yet has shown no sign of doing so.—*Lord Rosse, Birr Castle, King's Co., Ireland.*

Primula Winteri.—The bed shown in fig. 12 slopes slightly to N.E. and is protected by shrubs a few feet away. It is shaded from S. and W. by shrubs, and in great heat matting is also used. The soil is on the light side, but good; old leaf soil, sand, grit, granite chippings, loams, bonemeal as lime, and well-rotted manure.

In autumn after top-dressing, the bed is covered with frame lights set well above the plants. If watering is required afterwards, care must be taken not to water over the plants.

In late spring, according to the weather, the lights are removed entirely, the bed stirred, cleaned, losses replaced in fresh soil, and divisions made if necessary. Shading, watering and weeding are all that are wanted until about October. These Primulas will not stand winter wet in this high-rainfall climate.

Primula Winteri seems to have no other enemies here, but where losses occur, the plants just dwindle and go off at the collar, the outside leaves turning brown, the cause unknown.

Another bed on a steeper slope N.E. and so shaded that it had very little light, produced better plants and deeper-coloured flowers, but the shade is too dense for photography.—*W. W. Mathews, The Manor House, Tavistock, Devon.*

BOOK REVIEWS.

"My Flower Decoration Book." By Mrs. A. Lamplugh. 8vo. 103 pp. (Jenkins, London, 1937.) 5*s*.

This book will attract some people, especially those who live in small houses. It is full of suggestions for decoration, but many of them are rather unpractical.

Mrs. Lamplugh appears to favour cutting the heads off flowers, but unless these are floated in a large glass bowl only, so much of their beauty is lost. The suggestion that many odd shaped vases and tins should be used is not likely to improve the arrangement of flowers, nor would many people care to use baskets, as they seldom look well in a nicely furnished room. The book is well illustrated with photographs and the blanks for notes are useful.

LADY BEATRIX STANLEY.

"Some Beautiful Indian Trees." By the late Rev. E. Blatter and Walter S. Millard. 8vo. 110 pp. (Bale & Curnow, London, 1937.) 21*s*.

It is in the British tradition to plant trees in whatever land we find ourselves, but in the tropics those which bear flowers as well as give shade are the first choice.

As many of the trees treated in this book will flower when five or six years old, the reward for planting them will soon be obtained. They are not, it so happens, all Indian trees, but this fact merely broadens the scope of the book so that "Some Beautiful Indian Trees" is of service to everyone in lands where there is no frost.

Those of us whose knowledge of the East is reaped *en passant*, as well as those who have now retired from their labours there, will find this book just heart's delight, because though friends may come and go nothing lingers in the memory so long as the sight of a flowering tree. People of different generations can find a common bond in the remembrance of trees in flower at a particular spot.

Thirty-nine of the better known trees common to Indian town and country life have their beauties described and magnificently illustrated with thirty-one coloured plates and thirty-seven in black and white.

It is well to note here that the topmost foliage of trees becomes almost invisible in the refulgence of an Indian sun, and consequently that photographs taken under such conditions can only be adequately appreciated when held near strong artificial light; the Burmese Cassia in Bombay (p. 32), and Roxburgh's Kydia in Calcutta (p. 61) are examples.

The details given of each plant on its distribution, flowering, leaf-shed, fruiting, and method of natural reproduction suggest a degree of knowledge of their subjects on the part of Mr. W. S. Millard and the late Rev. E. Blatter that is more than substantiated by the notes on artificial reproduction and cultivation in gardens, which prove them good plantsmen who write of what they have done, while the information given under economic value, domestic uses, medicinal properties, popular beliefs and popular names discloses a degree of scholarship, research and appreciation that is only too seldom met with in similar works. There are two indexes, one for the Latin and one for the English names, and it is a matter of regret to find that the authorities at Kew, who have checked the scientific names, have decided that among other up-to-date restoration of old names the well-known 'Flamboyant' or 'Gul Mohur,' *Poinciana regia* Boj., must henceforth be called by botanists *Delonix regia* Rafin. Such botanical names are frightening, but the book itself is full of information written in an attractive manner, so that it can be read with as much pleasure in an armchair in this country as it will be for its practical value to those in gardens nearer the equator from Australia to America.

It maintains the broad educative outlook which is known to be the policy of all works of the Bombay Natural History Society and is printed and bound to make a volume whose value is assured by the name of the publishers.

R. E. COOPER.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXIII

March 1938

FORTHCOMING EVENTS.

At the two Fortnightly Meetings in March (March 8 and 9 and March 22 and 23, each open on the first day from 12 noon to 7.30 P.M., and on the second from 10 A.M. to 5 P.M.) spring flowers will form the bulk of the exhibits. On March 22 there will, in addition, be two competitions, one for amateur Orchid growers for exhibits of twelve Cymbidium plants; and the other for a silver cup, presented by the Hon. HENRY TUFTON, offered for the best Cymbidium, old or new, exhibited at the Show, open to amateurs and horticultural traders. Particulars will be found on p. 33 of the January JOURNAL.

On March 8, at 3.30 P.M., Mr. R. B. LAWSON will lecture on "Lawns," and on March 22, at 3.30 P.M., it is hoped to welcome Captain KINGDON WARD back from his expedition in Burma, and to hear his lecture on his recent travels. News of his return is still awaited.

On Saturday, March 26, the London Gardens Society will hold their exhibition of spring flowers in the Old Hall from 1 to 7 P.M.

The Alpine Gardens Society's Show is on March 29 (1 to 7.30 P.M.) and March 30 (10 A.M. to 5 P.M.) in the Old Hall. Fellows' tickets will admit to both these Shows.

On April 5 (12 noon to 7.30 P.M.) and April 6 (10 A.M. to 5 P.M.) there will be a Fortnightly Meeting, and on this occasion there will be a competition for the Sewell Medals for exhibits of plants suitable for the rock garden or alpine house. There will be a gold medal offered for an amateur exhibit, and one for a horticultural trader's exhibit. The particulars of the competition will be found on p. 31 of the January JOURNAL. These competitions are worthy of more entries than they have received in the past.

On April 5, at 3.30 P.M., there will be a lecture on "Plant Hunting

in China" by Prof. H. H. HU, but owing to the circumstances prevailing in China, the presence of Prof. HU at his lecture has been unavoidably prevented. Arrangements are being made, however, for his lecture to be read. It should be of great interest, as part of the explorations have taken place in districts not previously visited for the purpose of collecting plants. At 4.30 P.M. a Conference on damage done by the Bishop Fly to Chrysanthemums will take place.

On April 6, at 3.30 P.M., under the auspices of the Institute of Landscape Architects, there will be a lecture by Captain O'KELLY, A.I.L.A., on "Parks and Playgrounds." Fellows of the Society will be welcomed.

On April 12 (1.30 to 7.30 P.M.) and April 13 (10 A.M. to 5 P.M.) both Halls of the Society will be occupied—the New Hall by the Daffodil Show and the Old Hall by the Early Market Produce Show. Both these Shows are of great interest. In the former the wonderful progress in the development of the Daffodil will be displayed, and in the latter the progress made in the production of early vegetables and flowers for the market.

In the afternoon of April 12, at 3.30, Monsieur A. L. SIMON will lecture on "Unusual Vegetables for the Garden and the Cook," a subject which should be very attractive to many Fellows.

Special attention is drawn to two practical demonstrations of garden work at Wisley. On March 16 and 17, from 2 to 4 P.M., on Rose Pruning, and on April 6 and 7 on the Spraying of Fruit Trees and the Pruning of Shrubs. Fellows desirous of seeing these demonstrations are asked to write to the Director of the Gardens beforehand, so that arrangements for their comfort may be made.

Examinations are an important part of the Society's activities. The practical examination of the British Floral Art Diploma will be held on March 16 and 17, and Fellows are invited to come and see the candidates' work staged in the Old Hall on the afternoon of March 17 from 2.30 to 5 P.M.

On March 8 the Society's General Examinations, and on March 19 the Examination in School and Cottage Gardening for Teachers will take place throughout the country.

Particulars of the Conference on Flowering Trees and Shrubs (other than Rhododendrons) to be held from April 26 to 29 were given in the February JOURNAL. Circulars giving the full programme of the lectures, excursions and competitions have been sent to those Fellows who are known to the Secretary as enthusiasts, but there must be many more who would wish to have further particulars. Would Fellows, therefore, kindly make an early intimation to the Secretary of their wishes to attend the Conference, so that the final arrangements may be made.

The full Calendar of the year will be found at the beginning of the January JOURNAL.

* * * * *

Fellows will be interested to know that arrangements are now being made for a Conference in 1939 on the subject of Rhododendrons.

Any Fellow particularly interested in these plants is asked to inform the Secretary, so that he may receive particulars when they are ready.

* * * * *

One of the many attractions at the Fortnightly Meetings is the table for small exhibits from Fellows. Most Fellows have from time to time some plant, flower, fruit or vegetable which, because it is uncommon or especially well grown, would be of interest to other Fellows, and the small Exhibits Table in the dais is specially provided for these exhibits. It is not necessary to apply beforehand for space, but if Fellows will bring their exhibits by 12 noon on the first day of a Meeting, and hand them to the clerk in attendance he will see to their staging and labelling. Exhibits staged under this arrangement should not consist of more than three pots, vases or dishes.

* * * * *

Publications.—The attention of Fellows is drawn to the article on p. 110 in this number of the JOURNAL, on the recently published Index to the Society's JOURNAL from 1838 to 1935, and a List of Awards made to Plants, Fruits and Vegetables from 1859 to 1935. It is hoped that Fellows will take the opportunity of purchasing this important book of reference.

* * * * *

Wisley in March recalls the sheet of soft yellow flowers of *Narcissus Bulbocodium* on the Alpine Meadow, yearly becoming larger, and the patches of even richer gold made by *N. cyclamineus* in the damp places of the Wild Garden; encrusted Saxifrages in their pans in the Alpine house, the foliage entirely concealed by closely-packed blossoms of white, pink, rose, carmine, or yellow; Forsythias and Almonds bringing colour to the trees and shrubs in Seven Acres and Howard's Field; the large plantings of the Heathers; and the varieties of the pink-flowered *Prunus cerasifera Pissartii.*

Acacia dealbata beside the entrance door of the Laboratory still carries its weighty sprays of Mimosa blossom, while in the Half-hardy and Temperate houses are other species of this attractive genus, including the prostrate form of *A. diffusa* from Tasmania. In the former greenhouse also is the Balearic Pæony (*Paeonia Cambessedesii*), the first to appear above ground in the spring, producing pink flowers surrounded by reddish-tinted foliage. The white *P. cretica* will follow a little later in the same house. In the second house Cinerarias will probably be the chief feature, accompanied by Kurume Azaleas and the long blue spikes of *Coleus Frederici.*

The Wild Garden and Seven Acres are full of interest and on the Rock Garden *Narcissus nanus* grows happily, and early-flowering plants as *Rhododendron leucaspis, R. moupinense, Daphne Blagayana,* the Water-lily Tulip (*Tulipa Kaufmanniana*) and bright blue Scillas and Pulmonaria add colour to the garden. In the Alpine house the Saxifrages are supreme, but *Narcissus Watieri,* from the Atlas Mountains, Primulas and Cyclamens and the tufted golden-yellow *Morisia hypogaea* are all worth examining, as well as many other plants.

ORCHIDS.

By Sir JEREMIAH COLMAN, V.M.H.

[Read October 26, 1937; LORD ABERCONWAY, V.M.H., President, in the Chair.]

I PROPOSE as a preliminary to endeavour to answer some of those awkward questions which are frequently put to me when showing visitors round my Orchid houses. Perhaps the most natural of them all is "What is an Orchid? How can we tell it from the lower orders which are known as 'florists' flowers'?"

The first discovered Orchid apparently came under notice in Great Britain; someone, having found it, dug it up, and concluded that its roots resembled a testicle and, as "orchis" is the Greek word for testicle, the name "Orchis" was given to the first Orchid discovered. It is a little unkind to dig a plant up in order to come to a conclusion as to what it may be, and by no means do all Orchids have similar roots.

The word "orchis" became corrupted into "orchid" later.

I have taken a very great deal of trouble to try to find a description of an Orchid which would enable you to know it when you see it. My friend, Mr. GURNEY WILSON, the Secretary of the Orchid Committee, has found me a definition given in rather recent times by Dr. HUTCHINSON. Here it is:

"Perennial, terrestrial, epiphytic or saprophytic herbs with rhizomes or tuberous roots or rootstock; stem leafy or scapose, frequently thickened at the base into pseudo-bulbs and bearing aerial assimilating roots. Leaves undivided, alternate and often distichous, rarely opposite, sometimes all reduced to scales, often fleshy, sheathing at the base, the sheath nearly always closed and encircling the stem. Flowers often of very beautiful form and colour, but sometimes small and colourless or brown or green, bracteate, hermaphrodite, or very nearly polygamous or monoecious, zygomorphic; inflorescence spicate, racemose or paniculate, or flowers solitary."

I will give you that for a start when you ask what an Orchid is—I could give you much more, but if you remember the first part you will know more than most people. The rest is as follows:

"Perianth epigynous, composed of six petaloid segments in two whorls, or the outer whorl calyx-like and the inner corolla-like, or the outer rarely corolla-like, and the inner minute, free or variously connate in each whorl; outer segments (sepals) imbricate or valvate, the middle segments of each whorl generally different in size and colour from the lateral ones, especially the middle 'petal,' which is often extremely complicated in structure and is termed the lip or labellum; on account of the twisting of the ovary through 180° the



FIG. 13.—BRASSOCATTLEYA × GATTON LILY.
(**F.C.C.** 1918.)
The actual flower is twice the dimensions of the illustration.

[*To face p.* 100.

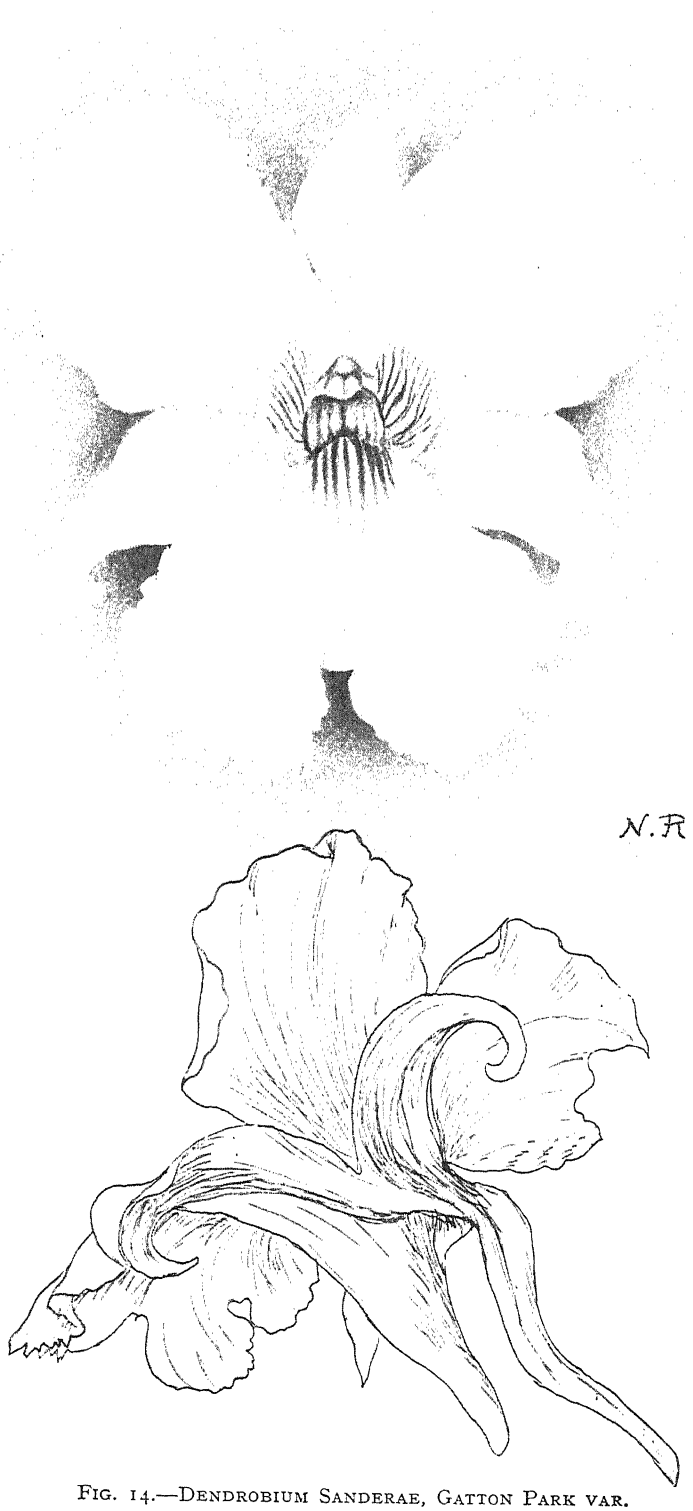


FIG. 14.—DENDROBIUM SANDERAE, GATTON PARK VAR.
(A.M. 1933.)

labellum is often placed in an abaxial position ; frequently the labellum or more rarely the odd sepal is prolonged into a sac or spur (sometimes very long) often containing nectar or nectar-secreting tissue. Stamens two or one, anther or anthers two-celled, introrse, opening by a slit lengthwise ; pollen granular or generally agglutinized into mealy, waxy or bony masses (pollinia) ; at one end the pollinium may be extended into a sterile portion (caudicle) ; the pollinia may be free in the anther-cells or more or less loosely united. Ovary inferior, one-celled with three parietal placentas or very rarely three-celled with axile placentas (Selenipedium, Phragmipedium) often produced at the apex into a special structure (column) ; stigma three fertile (Cypripedieae) or more frequently the lateral two fertile ; the other sterile and transformed into a small outgrowth (rostellum) which lies between the anther and the stigmas ; a portion of the rostellum is sometimes modified into a viscid disk (viscidia) to which the pollen is attached. Ovules very numerous and minute, anatropous. Fruit usually a capsule, mostly opening laterally by three or six longitudinal slits. Seeds very numerous, minute, often drawn out at each end or rarely winged, with endosperm ; embryo not differentiated."

I hope Dr. HUTCHINSON will be given credit for having provided a definition which will enable you to know an Orchid when you see it.

The next question generally asked me is, " Where do Orchids come from ? " or " Where can one find Orchids ? "

Go north, go south, go east, go west, there will you find Orchids, and if we are allowed to take hybrids into account, I can add, as I wish to, that " Home is best."

As an illustration we received from abroad two species, one of which is *Cattleya Schroederae* and the other *Brassavola Digbyana* ; the flower of the latter is a dirty, greyish white, the main feature of which is the broad frilled lip. We married these two in this country and we produced *Brassocattleya* × *speciosa*, and they go forth putting species in the shade. I cannot help being egotistical a little, because in describing my own things it cannot be avoided. Similarly we produced *B.-c.* × ' Gatton Lily ' (fig. 13).

I sent one of these to a friend in Honolulu, and he wrote me a year or two afterwards and said, " We had to crown our beauty queen ; we searched Honolulu to find the most beautiful flower which existed there, and our choice fell upon that *B.-c.* × ' Gatton Lily.' "

Another friend came to me from a foreign country and said he had been to see the Orchids in one of the most famed Eastern gardens, and most conspicuous and most beautiful of all he saw there was *B.-c* . × ' Gatton Lily.'

We do with Orchids as we have done with cattle, sheep and horses, and in these days I suppose I may say as we are doing with motor cars and aircraft ; we have done what no other nation has been able to do, we have originated the best. How long the enterprise of growers will keep Great Britain to the front is a problem which

can only be solved by results. I have recently heard from Australia of the success which has attended the growing of *Epidendrum* × 'Gatton Lilac,' and from South Africa of the success of *Dendrobium* × 'Jungfrau,' both raised in my gardens. These successes suggest that overseas lands may soon rival the Mother Country. I have not done when I say "go east, go west, go south or go north," but go up towards heaven. I do not know whether you will find Orchids in heaven itself, but I should rather think so as they are so beautiful. But go some hundreds of feet up mountains to the border-lines where you find clouds and snow and often frost: there you will find some of our finest Orchids. Dig down in the ground and you may find them, for there is one Orchid—*Rhizanthella Gardneri*—which never comes above the surface, for it flowers and roots some inches below the surface.

Some people are very hard of conviction, and one of my great difficulties is to persuade inquirers that Orchids are not parasites. In the early days it was believed the Orchid was a parasite, and that it could only be grown by having Crystal Palaces in which would grow high trees with plants on them. We do not call our daughters parasites because they attach themselves to protectors and friends who will enable them to get a little of the sunshine of this world: yet those are the reasons the Orchid is attached to trees and stones. In very many places they live where there is rough weather: they cling on to the trees in order that they may not be blown away; and they go to the tops of the trees in order that they may get all the sunshine that is going. So do not think that an Orchid is a parasite. It is an epiphyte.

I have another great difficulty, that is, in persuading my friends to believe that Orchids have any scent. If I can get any of these Doubting Thomases over to Gatton when my *Bulbophyllum macrobulbon* happens to be in flower, I take them into the houses and say, "There! do you still believe that Orchids have no scent?" They say, "No, it smells exactly like a dead rat." No doubt it has a savoury smell for the insect which it requires for fertilization.

I am indebted to Mr. CURTIS of the Orchid Review for the names of some of the scents that have been discovered. The following have been noted: sweet, fragrant, unpleasant, carrion, fishy, creosote, chlorine, *Gardenia jasminoides*; acorns, cocos-oil, benzoin, *Cyclamen persicum* and *Limnocharis emarginata*; anise, cucumber fruits, musk, coffee flowers, heliotrope, fungi, rhubarb, *Ulmaria palustris*; roses, rose leaves, pear-drops, fruits, lemon, lilies-of-the-valley, vanilla, aromatic fragrance, mixed odours. After that list of scents that have been discovered I do not think anyone could say Orchids do not possess scents, and some of them very beautiful scents. It only wants a RIMMEL to convert these if desired, by mixing, into almost any scent that is required.

Another question put to me very often is: "Is there any utility in Orchids?" I cannot make a very high claim for utility, but at any rate they are not like your poppies: they do not provide the

world with opium or dopes. I suppose the best known of the useful products from Orchids is vanilla; long before COLUMBUS discovered America the Aztecs used to flavour chocolate with vanilla; it was very well known then.

Some Orchids have medicinal properties—*Apostasia nuda* and others; and the pickled leaves of *Renanthera moluccana* compare with capers.

It is said—but I have never seen them—that some of the Orchids are used for the making of hats and other articles.

One doctor claims that he has found in an Orchid a cure for the horrible scourge of tuberculosis—I expect you will receive that statement with some reserve.

Another use in recent times has been made of Orchids. I understand that the girls of the present day accept an Orchid as evidence of affection or devotion, whereas they used in former times to require a lover to climb a mountain and secure Edelweiss. They have become wise in their generation, to prefer a lover who can afford to buy an Orchid to one who was prepared to risk his neck in getting the not very valuable Edelweiss.

Another question often put to me is, "Are Orchids delicate, are they lasting?" Here is a case. We flowered in my houses in February four years ago *Dendrobium Sanderae*. We were very anxious to keep it for the Ghent Quinquennial Exhibition on April 23. It showed no signs of fading, kept in good condition, and went to Ghent. It took a week to travel oversea in a dark pantechnicon; it was unpacked at Ghent, and remained in that exhibition for seven days —I do not know whether the President remembers, but it very nearly secured the award for the finest Orchid in the Ghent Quinquennial Show—it was runner-up, it secured second place; it was re-packed and brought across the sea again in the pantechnicon in the dark; it came home to my houses, and Mr. PERFECT, my able Orchid grower, said, "I think we can keep this for the Chelsea Show on May 23." It was kept till the Chelsea Show: it went up there and was given an Award of Merit (fig. 14). So, you see, it remained open under all sorts of conditions from February until the Chelsea Show was over.

I could give many other instances: I have sent Orchids from my houses to New York, Boston, and Missouri, some 800 miles the other side of New York! They have been packed and sent away in flower, arrived in good condition at their destination and been set up as a flowering group. Very few flowers, except everlasting flowers, would stand that kind of treatment, and I think I am justified in saying that Orchids have very lasting qualities.

Another constant question is whether Orchid growing is not a millionaire's hobby requiring houses of great heat. The answer is emphatically "No." Many of the most beautiful Orchids are comparatively cheap and can be grown in an ordinary greenhouse.

Then comes the frequent question, "How can we start a collection?" The best method is to take the advice of a responsible

member of the trade, who will have to consider what accommodation you can give the plants. This is very important. Many people start a collection by picking out plants in one of the pretentious groups which are set up at Chelsea or in the Society's Hall, not realizing that many of them may require special treatment. My last Chelsea group contained twenty-seven genera, namely: Cattleya, Odontoglossum, Brassia, Bulbophyllum, Dendrobium, Cirrhopetalum, Epidendrum, Lycaste, Eria, Maxillaria, Masdevallia, Pleurothallis, Cypripedium, Miltonia, Vanda, Listrostachys, Oncidium, Coelogyne, Phalaenopsis, Cymbidium, Platyclinis, Polystachya, Laelia, Tridactyle, Sarcochilus, Microstylis and Liparis. In each genus there may be many entirely distinct types—for instance, *Cattleya Skinneri* and *C. citrina*; and then there are hybrids between species, each differing from the other. In some instances one parent is used to growing in moist and cool places, the other in dry and hot. It would not be an exaggeration to say that the distinct types in my group at the Chelsea Show would number at least fifty.

There are many other preliminary considerations that I could talk about, but time will not permit.

I want to say a word or two about species which may interest you. When I first began Orchid growing practically only wild species were known. Travellers went forth and collected these plants, which were sent over as dried bulbs and then went into sale-rooms, such as PROTHERO & MORRIS'S, from whence they were disseminated. Those of us who thought we knew a good deal discovered later we did not know much, but we used to attend and pick out the bulbs that we thought were distinct; it used to be said if you got one special variety out of 20,000 you had not done at all badly.

I might say a good deal about species. I might mention the peculiarities of one or two. I may say that, as far as the peculiarities are concerned, they are undoubtedly for the most part adaptations to secure the perpetuation of the species. Providence evidently intended that the species should remain pure, and whilst providing the species with the means of reproduction, also took care to see that there was provision for the prevention of undesirable visitors from giving the Orchids attention; insects were either driven away by fright, or were mechanically unable to get into the flower, or kept away by some other reason.

The first one I have to note is *Diacrium bicornutum*. I shall have to leave a little to your imagination, because I do not myself know the real truth, but you may be sure Providence had some intention. The bulbs of this Diacrium are hollow like a cane, with an entrance at the bottom; a horrible ant finds this a very nice home, it enters at the bottom and goes up the stem and there it rests. The interesting part of the tale is this, that the plant is visited by an enemy; this very undesirable enemy begins by climbing the outside of the bulb; the ant from inside hears, and this insect happens to be one which the ant likes to have for food, so it dashes out of the hole and lugs the

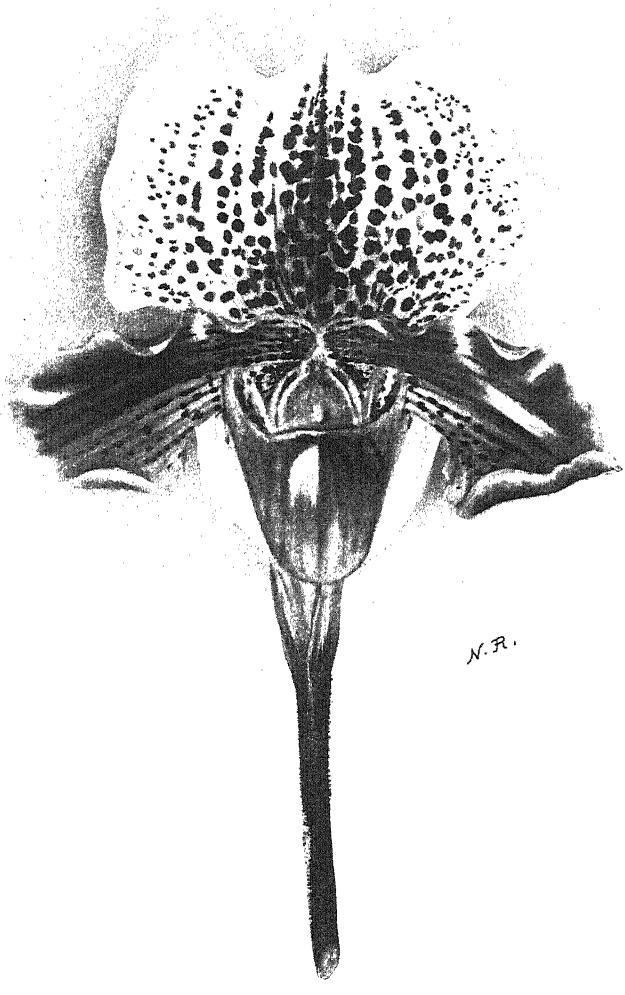
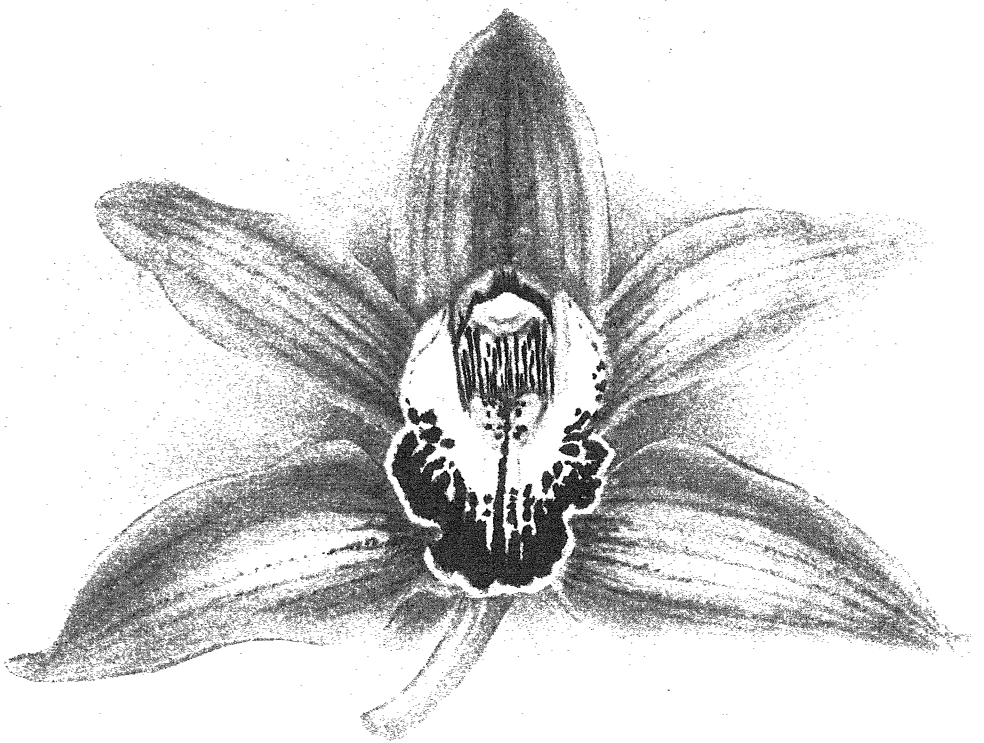


FIG. 15.—CYPRIPEDIUM 'JOHN HENRY' (× ¾).
(**A.M.** 1930.)

[*To face p.* 104.



N.R.

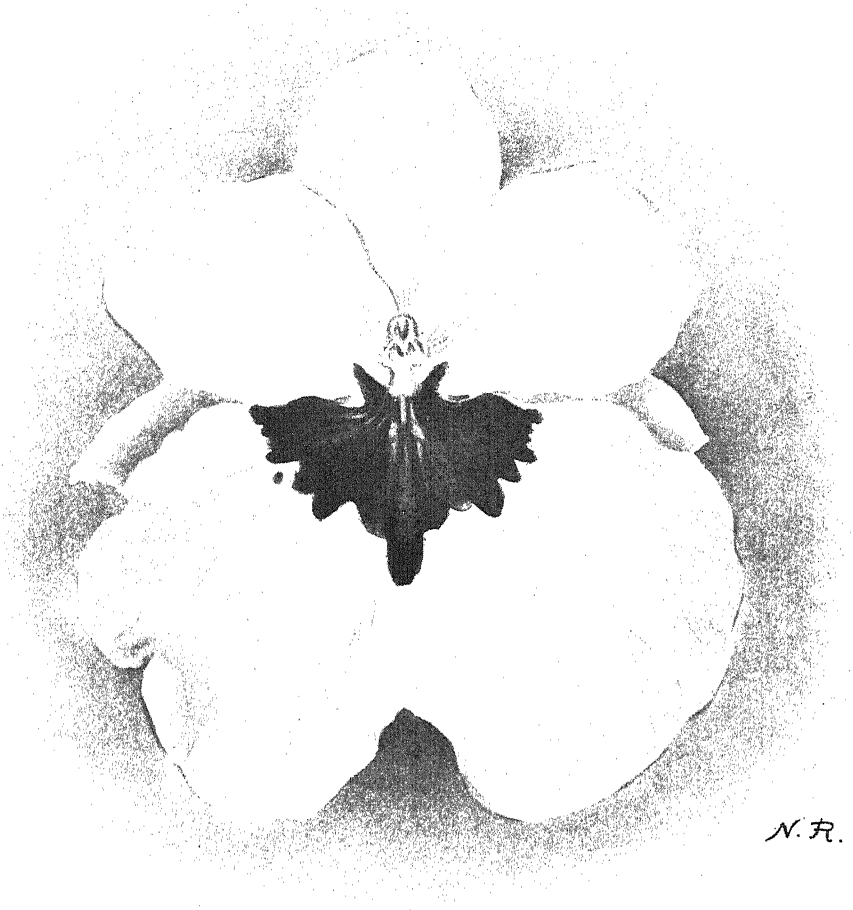
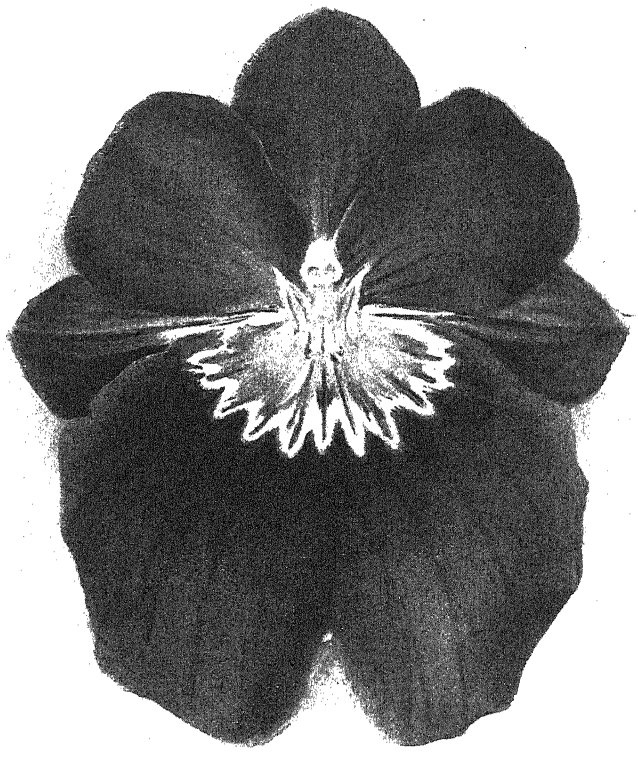


FIG. 17.—MILTONIA × 'GATTON PRINCESS.'
(**A.M.** 1936.)



N. R.

FIG. 18.—MILTONIA × 'BRUGES,' GATTON PARK VAR.
(**A.M.** 1936.)

[*To face p.* 105.

insect in to devour it: thus the hollow provides the twofold purpose of enabling the ant to get food and of preventing the undesirable insect from climbing and entering the flower. I see our President looks rather sceptical, but I am only telling the tale. You must draw your own conclusions from the existence of the hollowed-out bulb, the ant which lives in it and the insect which climbs up and is caught.

Stanhopea is one of those Orchids which have caused a good deal of trouble and misunderstanding. It has a very beautiful flower, but nobody could flower it, although it grew very nicely in pots. One day a young boy engaged in the houses, being either forgetful or careless, dropped this very precious plant. He naturally was frightened in expectation of being reproved, but when the remains of the plant were picked up the flower was discovered: the spike grew downwards, and so long as the plant was grown in a pot it never could be seen. So now we grow it in a basket and flower it.

Very varied and ingenious are the methods by which pollination is secured. The unconscious agent is not always attracted by food or scent. In the case, for instance, of *Ophrys Speculum* it has been noticed that the visiting insect, *Scolia ciliata*, a member of the burrowing family of Hymenoptera, is invariably the male and that the flower has no attraction for the female of the species. As a result of observation it was established that the male emerges from the burrow a month in advance of the female, and so, like Adam, finds itself alone in the wide, wide world. In its search for companionship it becomes attracted by the metallic lustre of the flower which resembles the female. Mimic advances and mild flirtations follow, and, as a result, the pollen mass becomes attached to the Scolia and on repetition of the attempt at love-making with another flower pollination takes place—one of the wonders of Nature prompted or excused, since the insect will never have seen the female for which it makes search.

One of the most remarkable of all Orchids is *Coryanthes macrantha*, or "Helmet Flower." It has a helmet-shaped pouch which is supplied, drop by drop, with a sweet fluid from two tap-like lobes that function for about twelve hours. Bees alighting on the flower jostle one another until one falls into the liquid which causes its wings to adhere to the body. The bee then struggles until it finds a certain hole, and in passing through it carries away the pollen mass. The bee then drops to the ground, where the sun gradually dries its wings and enables it to fly off to the next flower, thus carrying out the process of fertilization which the intricate mechanism of the Helmet Flower was designed to produce.

In *Masdevallia muscosa* the special feature is the lip. When an insect alights thereon it closes with a jerk. Were it to close immediately it was touched the insect would be shut out, so there is a pause sufficiently long for the insect to get inside.

In the case of *Bulbophyllum Lobbii* the lip is simply on a swivel, and when the insect advances to a point it is thrown up against the pollen mass.

Anguloas are known as "Cradle Orchids." The lip acts very similarly to those belonging to the Bulbophyllums.

In many Catasetums upon the lip being touched the pollen mass is liberated and springs away from the flower, adhering to the object which has touched it.

Then there is *Acineta chrysantha*, the "Umbrella Orchid," so called because the dorsal sepal is hood-shaped and protects the column from the rain, which in its native home of Panama is a daily occurrence—an undoubted adaptation.

I have already spoken of the subterranean Orchid, *Rhizanthella Gardneri*.

Another interesting feature is the enormous number of seeds to be found in one pod. Of course, that is because of the mortality amongst the seeds. I have never counted them! but it is estimated that in a fruit of Acropera there are 74 million seeds! Undoubtedly the Orchid seed is the smallest of any seed. These minute seeds are very difficult to germinate, since they contain little albumen to nourish the embryo, which is left to fend for itself, and will not germinate under conditions which other seeds find satisfactory. At one time it was supposed that they would only germinate when in contact with certain fungi (mycorrhiza). Recent research has led to the discovery that certain nutritive vegetable jellies can give the requisite aid. It would take me hours to explain the difficulties, but, in general terms, scientific experiments have enabled us to raise all well-fertilized seeds. NOEL BERNARD has established by scientific experiment that in Nature all Orchids live in symbiosis with a fungus. From a biological point of view an Orchid represents life in common between two subjects which look like a single plant, but whilst in Nature Orchid seeds will not germinate except in symbiosis, in the laboratory nutritive solutions have been found which can be substituted.

You do not now see many species, partly because they have been surpassed by the hybrids which are superior in appearance and easier to grow, but I think also because people are unsuccessful in growing them. These three varieties of *Laelia pumila* before me have really been brought up because I want to talk to you about blue Orchids.

I said to a well-known horticulturist the other day, "Do you know where you can find *Laelia pumila* which used to be very common?" He said, "I do not know anybody who has kept that alive; they were kept alive for a few years and they have died out." Here is a plant my grower has kept alive in my houses for forty years. You will see it is very different from the centre one; it has been used in producing some of the so-called blue Orchids.

Now I will pass on to what is perhaps a more interesting subject —that is, hybridization. For a long time we had only one or two varieties to work upon. Here is a practical illustration of what the hybridist has done. This is one of the first of the Cypripediums—it was brought over and called *Cypripedium Spicerianum*; here is

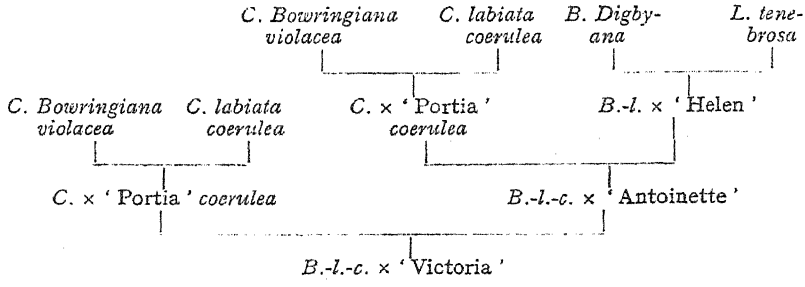
another of the early importations, known as *C. insigne*. These two were married and they produced *C.* × *Leeanum*, which, you see, is an advance upon either of them. It is not an Orchid fancier's flower, because he does not like the lip to reflex as that does, and he likes something large and gaudy, but I think that is a thing of very great beauty. This was the first hybrid raised from those two.

The hybridists have gone on with a variety of crosses, and here is one of the most up-to-date results—*C.* × 'John Henry' (fig. 15). This is an enormous improvement upon the two with which they started.

I have endeavoured to do all sorts of things, amongst others to raise a blue Orchid. In the result we have raised a strain of great delicacy to which the Orchid world has accorded the name of 'Gatton Blue,' but Orchids are of almost every colour in the rainbow.

This ('Lady Mandleberg') was produced by hybridization, working away from *Cattleya Bowringiana*. Unfortunately my greatest treasure of all has not come out in time for exhibition. We have now produced that and it is very fine indeed; I shall not be satisfied until we have produced something of the 'Gatton Lily' size, which I think I may do, but we have to wait. It takes seven years to raise and flower a hybrid, and it may take five or seven times that before we get anything which we consider respectable, or which reaches our ambitions. That means, of course, you may have to go thirty-five years or forty-two years before you get what you want, and when you are nearly fourscore years, you begin to wonder whether you will see the result of your labours.

The tree herewith, showing the parentage of *Brassolaeliocattleya* × 'Victoria,' evidences the patience required and the procedure which has resulted in a 'Gatton Blue' Orchid.



Further, to produce an *Odontonia* × 'Gatton Glory,' *Odontoglossum crispum* was used three times, *O. Harryanum* once, *O. triumphans* twice, *O. Pescatorei* twice, and *O. luteo-purpureum* and *Cochlioda Noezliana* once.

There were rather inferior things to work upon originally, but in later years discoveries have been made of novelties that are very useful. Take Cymbidiums: they were nothing very magnificent. Nowadays they are very beautiful with sprays bearing a large number of flowers. I have here a list of some of the resulting hybrids. Probably you all know the Cymbidium. It is very lasting, it can be grown in

heat, or without much heat, and in Australia and other climates it can be grown out of doors, and is extremely useful. First of all, they had one or two rather poor things, *Cymbidium eburneum*, which threw up only one flower, and *C. Lowianum*. Then *C. insigne* (*Sanderi*) was discovered and crossed with *C. Lowianum*, which produced *C.* × *Alexanderi*, named after Mr. ALEXANDER. It was crossed with *C. grandiflorum* and produced that very beautiful hybrid *Coningsbyanum*; crossed with *C. l'Ansonii* it produced *C.* × 'Ceres,' also very beautiful. I crossed it with *C.* × 'Lady Colman' and produced *C.* × 'Queen of Gatton'; it was crossed with another *C. Lowianum* and produced another lovely thing, *C.* × *Pauwelsii*.

Going on to the second generation, *C.* × *Alexanderi* was crossed with *C. grandiflorum* and produced that very wonderful hybrid known as 'Pearl' (fig. 16).

That gives you some knowledge of the use made of the different species. Perhaps the life history of the Miltonias will be as interesting as anything. A naturalist was looking over the side of a ship and saw an Orchid in flower attached to a piece of wood floating in the water. He was not a horticulturist, but he thought it was something new: he drew it as well as he could, and the sketch was sent over here, and I think Mr. SANDER said, "That is a new thing and very valuable: now we have to find it." Of course it was fairly obvious it came from one of the tributaries of the river. A traveller was sent out and it took him two years to discover it, and it proved extremely difficult to get over. I have just had what I believe is rather a triumph: I have managed to import one of these alive into New Zealand. They have been trying very hard to get it in New Zealand, and I have no doubt it will grow there. Thousands of these Miltonias were imported, and amongst them came that curious variety with the butterfly centre, *Miltonia vexillaria* var. 'Memoria G. D. Owen.' It was bought for about £70, and later fetched £1,375, when it was thought by Continental growers, although very doubtful whether it would be successful, that the mask might be reproduced in hybrids. There is a similar species called *M. Roezlii*, and one single plant out of thousands came a deep red colour.

Those two parents were used—and the type has been turned out of every house as worthless—those two, *M. Roezlii* for colour, one single plant, and *M. vexillaria* 'Memoria G. D. Owen' for the beautiful centre, have been used, and all the beautiful Miltonias in different collections come from one or both of those plants. *M.* × 'Gatton Princess' (fig. 17) I raised myself. There is another one which is very much larger, *M.* × *Myrna* 'Constance Mercer'; *M.* × 'Bruges,' Gatton Park var. (fig. 18), is very much better; but you have almost every conceivable shape and form, and, as I say, they are things of immense beauty. It is a question of natural history and a misfortune that some of these should disappear, and you get the survival of what is in one sense superior, but it is not always the survival of the fittest, because the species are more hardy than the superior hybrids. It

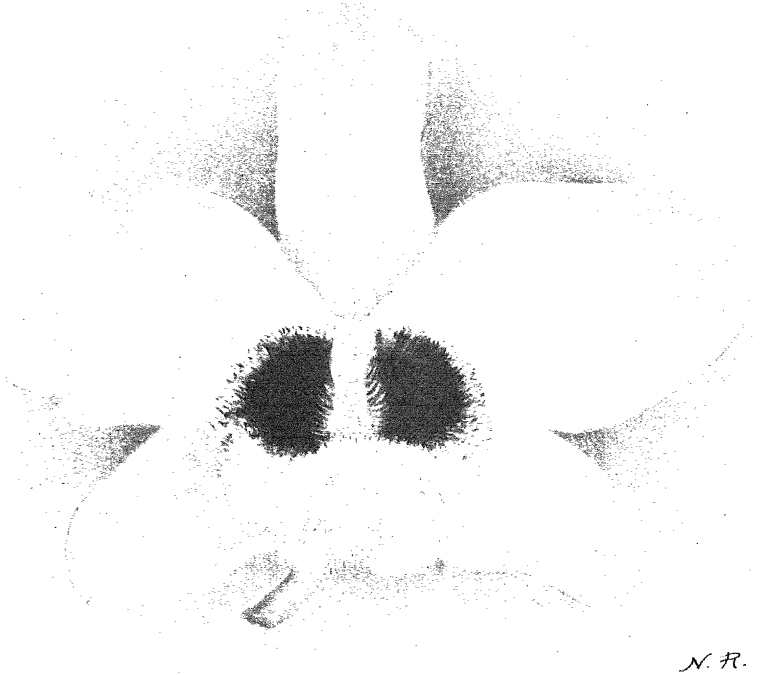


FIG. 19.—DENDROBIUM × 'GATTON SUNRAY.'
(F.C.C. 1923.)



FIG. 20.—DENDROBIUM × 'LADY COLMAN.'
(A.M. 1909.)

[*To face p.* 109.

gives you a lesson in eugenics, and how, if you want to have good children and a good community, you must have good parents to produce them.

For a long time we concentrated upon Dendrobiums at Gatton. *D.* × ' Gatton Sunray ' (fig. 19) is the finest ever raised ; *D.* × ' Lady Colman ' (fig. 20) is accounted to be the finest typical *D. nobile.*

The Odontioda is an example of the introduction of red. It comes from *Cochlioda Noezliana.* It was realized that if once the cross with Odontoglossums could be effected it would produce a very useful colour. There was a furore when the first appeared. Someone gave £100 for a single flower, thinking he might produce something very fine from it. As a matter of fact the secondary hybrid therefrom produced nothing worth having. A primary hybrid I raised secured the Cup for the finest Orchid exhibited in the International Show at New York.

In more recent times we have been working upon Lycastes. It took twenty years before we discovered how to get the seed to grow : it sprouted, but would not grow, because it had not the food necessary for growth ; but the secret was discovered, and now I have a good many thousands of these coming along, among them *Lycaste* × *Olivia,* resulting from crossing *L. xytriophora* with *L. Locusta.* At the Chelsea Show I exhibited *L.* × ' Queen Elizabeth,' named after our Queen, a cross between *L. Skinneri alba magnifica* and *L. Locusta,* Sander's var. I also exhibited *Angulocaste* × ' Georgius Rex,' a cross between *Anguloa Cliftonii* and *Lycaste Imschootiana.* There is every reason to anticipate that we shall have even greater treasures.

We have a number of other novelties which have an equally interesting history. *Odontioda* × *Colmaniae,* the only one ever raised suggestive of the M.C.C. colours, is a Gatton hybrid.

THE INDEX TO THE R.H.S. JOURNAL, 1838–1935, AND LIST OF AWARDS, 1859–1935.

By FRED. J. CHITTENDEN, F.L.S., V.M.H.

THE publication of matters of horticultural interest that came before The Horticultural Society of London began in 1805 and has been continued almost without intermission ever since. The first records are contained in the ten quarto volumes of *Transactions* which appeared between 1805 and 1848, and the information contained therein is easily consulted, for the last volume included a general index to all of them.

Between 1838 and 1935 seventy-six further octavo volumes have appeared, and although an index is contained in most of them, from the nature of things the information contained in the 45,500 pp. and the hundreds of figures cannot readily be found and is thus apt to be overlooked.

The Index just published is intended to remedy this. It is largely an Index of names of plants, and an endeavour has been made to include references to all plants which have come before the Society either at its meetings or in communications such as lectures, articles and notes that have appeared in these volumes. References to plants where no information is given concerning them are usually omitted, but the first reference to their appearance before the Society is indexed. The Index also gives references to conferences, subjects and authors of lectures and articles, but omits references to books reviewed.

The Journal has appeared under several different titles, viz., (1) Proceedings (1 vol. 1838–1843); (2) Journal (9 vols. 1846–1855); (3) Proceedings (5 vols. 1859–1865); (4) Proceedings—New Series (1 vol. 1866–1869); (5) Journal—New Series (60 vols. 1866–1935). The different series are indicated by different notations in the Index.

In addition to the ordinary references the Index contains an indication of the Awards which have been made by the Society to individual plants (including fruits). These Awards have been made from time to time on the recommendation of Committees appointed to examine the exhibits shown before the Society at its meetings or tried (under special regulations) in its garden or in special trial gardens.

The first of these Committees, the Fruit and Vegetable Committee, was set up in May 1858, followed by the Floral Committee in June 1859, and the Scientific Committee in May 1868. In 1885 the Narcissus Committee was cut off from the Floral Committee, and later the judging of Tulips was also transferred to the new Committee, which became the Narcissus and Tulip Committee. The Orchid Committee was similarly cut off from the Floral Committee in 1889. In 1924, as its work continued to grow, the Floral Committee was divided into two

parts, Floral Committee A being entrusted with the judgment of florists' flowers, Floral Committee B with other ornamental plants not otherwise provided for. Meanwhile, a system of Joint Committees has been inaugurated for the judging of special plants, half the members of each Joint Committee being appointed by the Royal Horticultural Society, usually from among the members of its Floral Committees, the other half by the special Society concerned with the flower. The first of these Joint Committees was appointed to deal with Dahlias at the request of the National Dahlia Society, and others deal with Bearded Irises, Border Carnations, Perpetual-flowering Carnations, Rhododendrons, Sweet Peas, and Delphiniums. These Joint Committees select plants for trial and judge them when growing, as well as at the Society's Shows and at the Shows of the special Society.

The Awards the Committees were empowered to recommend were at first the First Class Certificate (**F.C.C.**) and the Second Class Certificate (**S.C.C.**). Plants might also be Highly Commended or Commended, usually after trial, but as these Awards are of minor importance they are not referred to in this list. Occasionally a Special or Bronze Medal was awarded, but this was unusual. In 1878 a new Award was instituted, the Botanical Certificate (**B.C.**), now given on the recommendation of the Scientific Committee to plants of scientific interest, but at one time recommended by any Committee.

It will be seen from the Index that very large numbers of plants in the first thirty years of the Committees' existence received the **F.C.C.** and comparatively few the **S.C.C.** The dislike thus evinced to stigmatize a plant as second-class is perhaps understandable, but the real intention of the **F.C.C.**, which is to mark plants, etc., of *great* excellence, was thereby frustrated, and in 1888 the **S.C.C.** was discontinued and the Award of Merit (**A.M.**) instituted. The intention of this Award is to mark plants, etc., which show a distinct advance on their predecessors.

These Awards have often been recommended to plants as seen growing in the Society's Garden at Chiswick up to 1903, and subsequently at Wisley, but it sometimes happened that the standards for comparison were lacking, and in 1912-13 arrangements were made that when plants, etc., were grown for trial there should always be standard varieties, the qualities of which were well proved, grown beside them. Awards made after trial subsequent to the establishment of this system are indicated in this list by an asterisk (*) preceding the Award; thus ***A.M.** means an Award given after trial in the garden, as distinct from an Award given at a Show.

Some plants are pre-eminently suitable for cultivation in gardens in the British Isles because of the readiness with which they can be procured, their excellence, and the wide differences of conditions to which they are amenable. To mark these a new Award, the Award of Garden Merit (**A.G.M.**), was instituted in 1921. This award is given after trial, and on the recommendation of the Wisley Advisory Committee.

In 1931 an Award called Preliminary Commendation (**P.C.**) was instituted to be recommended for plants of promise newly introduced but not widely tested.

The name to which an Award is attached in this Index is not always that under which the plant was certificated, for occasionally it has been found that the name was erroneous and it was subsequently corrected; more often the name has been corrected in accordance with the rules of horticultural and botanical nomenclature. Where these alterations have been necessary, cross references are usually given. No attempt has been made to indicate the synonymy of all plants, etc., in this Index, and in many instances the plants are referred to under more than one name. Cross-references are given to many important plants and to many vernacular names.

Usually the entry of an Award (with the name of the person who showed the plant and the year in which the Award was made in parentheses) is immediately followed by a reference to the volume and page of the Journal where the record with a description is given. In some instances no such reference is given, for some of the Awards are not recorded in the Journal. Where references to the name occur only in the other parts of the Journals, the record of the Award is immediately followed by a semi-colon. A cross-reference may indicate where a description can be found.

In addition to providing references to information the Index shows in a great measure (though not an exhaustive one) the names which have been used in the past, and as a name can only legitimately be used for one plant, it will serve to show many of the names which may not again be used. It should be pointed out, however, that the whole of the references following one name do not necessarily apply to one plant only—the reader will need to bear this in mind.

In large groups, such as Begonias and Roses, an endeavour has been made to indicate the horticultural group to which a florist's flower belongs, and, where hybrids of species are concerned, to indicate the hybrid origin by the sign × preceding the specific name, except in multigeneric hybrids, where the mixed parentage is indicated by the formula following the name (*e.g.* Brassocattleya = Brassavola × Cattleya).

The Index often shows not only when a plant first came before the gardening public, but also in a large measure the period over which it has been of wide interest. It further shows the march of fashion in horticulture, the rise and often the fall in popularity of great groups of plants, the activity of hybridists in raising particular kinds of plants. Pelargoniums, for instance, occur in great numbers over one period and then are scarcely noticed; Bearded Irises made a sudden spurt at a particular period; Narcissi began their long course about the time of the first Daffodil Conference; the hybridization of Orchids began and reached its peak within the period, but here again there are sub-peaks evident in different genera; the vast influx of Chinese plants which had such an impetus in the early years of the twentieth

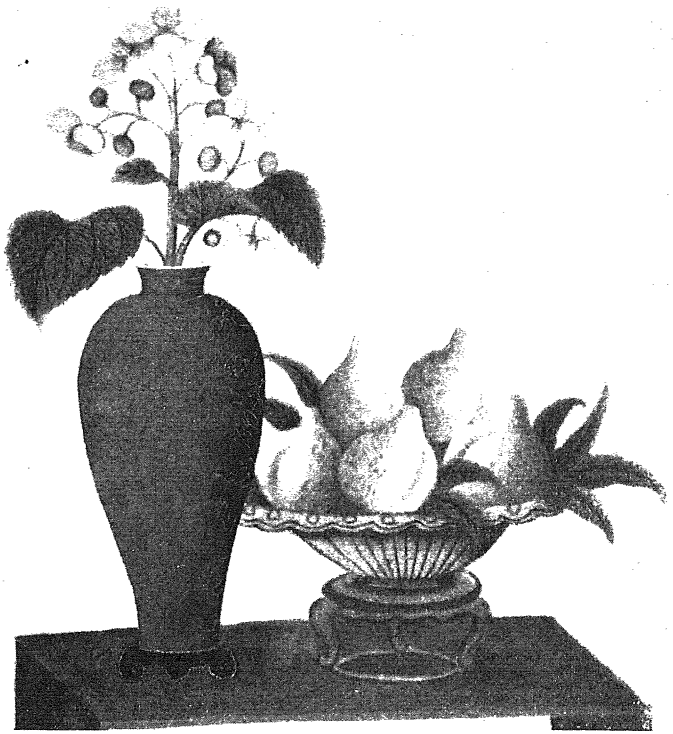


FIG. 21.—THE SOUTHERN CHINESE POINTED PEACH.

[*To face p.* 112.

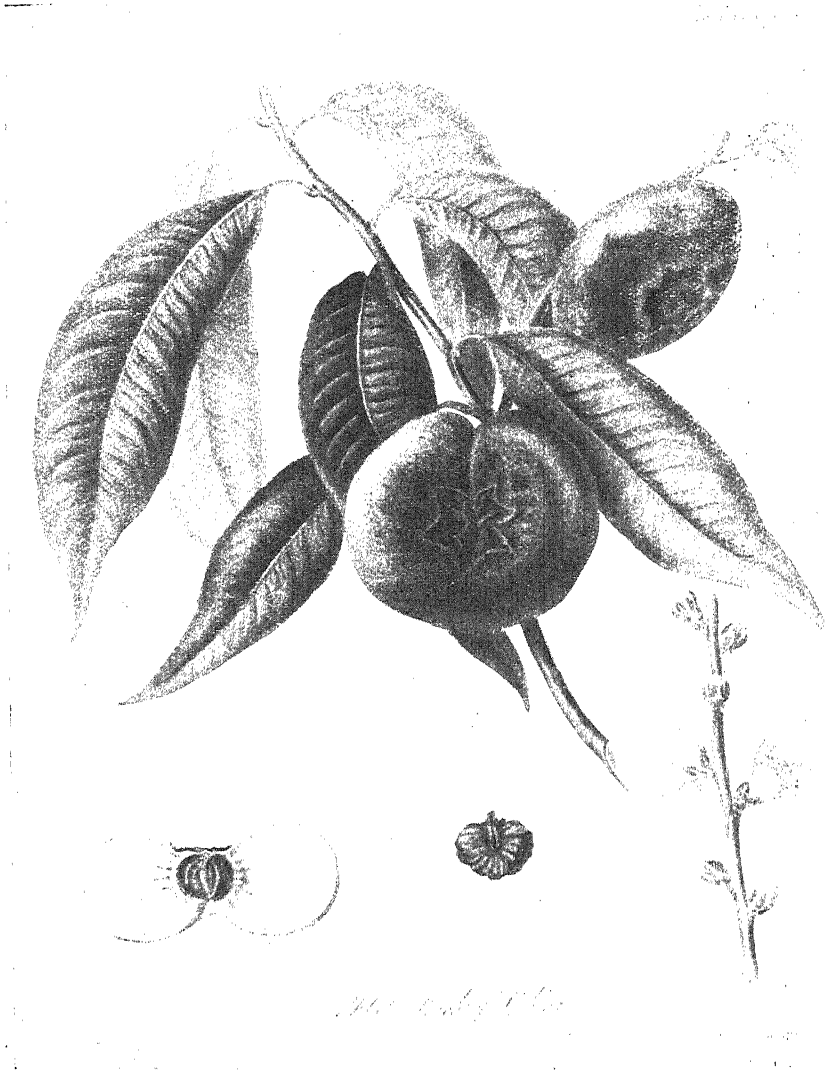


FIG. 22.—THE CHINESE 'PEEN-TO' OR FLAT PEACH.

century is reflected in the Index, and Rhododendrons especially loom large in the later days covered by the Index; in the early days New Holland plants appear, as well as many of the well-known Chinese plants now in our gardens, and South American and Western North American plants introduced by our Society's collectors. Perhaps Roses alone show a consistent record of references throughout the long period the Index covers, and some, like 'Aimée Vibert,' which is referred to in very early volumes, are still well known.

In conclusion I have to thank the many members of the Society's clerical staff at Wisley who have, mostly in intervals of their main duties, assisted in the collection of the references in this Index, and especially Misses McIntyre and White there, and Mr. M. Style, B.S.A., at Vincent Square, who have spared no pains in verifying references, etc.; and Messrs. Spottiswoode, Ballantyne & Co.'s staff for the care exercised in setting the enormous number of references in an intelligible manner.

THE HISTORY AND CULTIVATION OF THE PEACH AND NECTARINE.—I.

By EDWARD A. BUNYARD, F.L.S.

[Read October 12, 1937; Mr. C. G. A. NIX, V.M.H., in the Chair.]

THERE is no dispute to-day that China is the home of the Peach. When this suggestion was put forward by DE CANDOLLE in 1855 there was less agreement upon the point, but all the evidence which has accrued since that time has gone to prove that the eminent historian of plants was right, and that those who considered the Peach a development from the Almond of Western Asia were wrong.

Our knowledge of the flora of China, its literature and art, has during the last sixty years been greatly extended, and with the mass of evidence before us it is not easy to select the essential points. We may first summarize the botanical evidence.

Perhaps the earliest reference to a European discovery of a *wild* Peach in China is in SPATHARY'S Journey to Pekin, in 1676. On the borders of Manchuria he found wild Cherries, Vines and Peaches.

In recent times English and French botanists have explored much of the Chinese Empire, and there are many reports of Peaches growing spontaneously.

AUG. CHEVALIER (Académie des Sciences, 1921, p. 1127) reports a wild Peach in the mountains near Tonkin at 1000–1500 metres. E. H. WILSON found a wild Peach in Hupeh, in Ichang, which Dr. HENRY considered to be one parent of our cultivated Peaches, *Prunus Davidiana* being the other.

No similar wild Peaches have been found in Eastern Asia, and the botanical evidence is thus strongly in favour of China as the home of the Peach.

Still more impressive is the fact that the Peach goes so far back in Chinese literature and has gathered around it a store of folk legend in the same way as the Apple in Northern Europe.

WILLOUGHBY MEADE, in his Chinese Ghouls and Goblins, says: "There is no part of the peach fruit, branch or flower which does not figure in Chinese books of medicine or magic as a remedy for diseases caused by spectres; the red blossom of the peach also being of Yang, or solar colour, is, on that ground alone, of good omen. Peach wood stakes driven into the earth protect the home from demons, and arrows made from its branches are potent for the same end."

The Peach is in some sense the tree of life, and the pointed Peaches (see fig. 21) are emblems of long life. Porcelain models are made for presentation at the New Year, and such can be seen in several European museums.

The actual mention of the Peach in literature goes far back; it is found, according to BRETSCHNEIDER, in the Shi King, 551 B.C.

According to HENRY, all the cultivated Peaches of Europe may be found in China, and there are three main groups: the round Peach (as commonly grown in Europe to-day), the pointed Peach, and the flat or 'Peen To' Peach (see fig. 22).

The pointed varieties were grown in European gardens formerly. One well-known French variety, the 'Téton de Venus,' still exists, but they are generally rather tender, probably a Southern Chinese race, and now little grown in Northern Europe.

The flat Peaches, which show the stone so curiously, are not in favour in England, but are grown in America and, I believe, in Portugal and Italy to-day. In England we have preferred the round Peach, which is hardier than the two groups named and is also more suited for packing.

Such is, very briefly, the history of the Peach in China. We now turn to its arrival in Europe.

THE PEACH IN EUROPE.

There is abundant evidence of very early trading between China and Europe. The presence of Chinese porcelain in Egyptian tombs and the use of silk in the Alexandrian days of Greece show that there was exchange between the two countries, and we have thus a possible channel through which the Peach reached Europe, probably in the first century B.C.

As the early silk trade was directed mainly to Persia, the Peach was probably first grown in that country, and was thus known to the Romans as the Persian Apple, *Malus persica*.

The early Roman agricultural writers, CATO and VARRO, did not mention the Peach, but we find it in COLUMELLA, and of course in PLINY'S Natural History, that extraordinary repository of contemporary knowledge.

In PLINY'S time (first century A.D.) there were already several varieties of Peaches, and perhaps even Nectarines: some commentators think that his 'Duracina' was this fruit.

There were also Asiatic and Gallic varieties, and summer-ripening varieties, and others which were not ready till the autumn. It is possible that the summer-ripening fruits were Apricots, another native of China.

PLINY, however, was quite definite that all these fruits were recent arrivals in Italy: "It is only within the last thirty years that their summer ripening varieties have been grown."

We can gain a very good idea of the size of the Peach in the first century A.D. by the reproduction in fig. 23 of a Pompeian fresco, the first picture of the Peach in Europe that I have found. In the Naples Museum are preserved many fruit stones from the ruins of Pompeii,

and all that I have seen, whether Plums, Peaches, or Cherries, would be considered of an average size to-day.

It is thus probable that the Peach stones first brought from China were of some of the best cultivated varieties and even at this time of a size equal to our average to-day.

The illustration from the Pompeian fresco shows that both leaf and fruit were of fair size, and in the sculptured Roman urns of later date the Peach is very often included in the garlands of fruit and was shown as a fruit of large size.

In the centuries which followed the fall of Rome we are apt to think that gardening in Europe fell to a low ebb, but the fact that we meet the Peach, no easy plant to grow and propagate, in the fifth century in France, and again under CHARLEMAGNE about the year 800 —"Persicarios diversi generis," say the Capitularies—suggests a certain caution in thus deciding.

In England the existence of an Anglo-Saxon name for the Peach, "Perseoc-treou," establishes its presence in early days in our country. If ROGER of Wendover may be believed, King JOHN met his death at Newark, in 1216, from a surfeit of Peaches and ale. LYDGATE, the late fourteenth-century poet, included Peaches among the common fruits of this country.

It thus seems that the cultivation of the Peach was carried on from Roman days without a break, and so the Dark Ages were not perhaps so benighted, horticulturally, as many writers have assumed. The sheltered gardens of the monastery or castle would have provided likely places for Peaches as bushes or standards. It is generally thought that wall-trained trees did not come into use in this country until Elizabethan days or later.

It was, however, to the Renaissance, beginning in Italy and spreading from thence to France and, later, England, that the Peach owed its second awakening and distribution; and to this day the names of the old varieties, such as 'Melecoton' ('Melo-coton'?), etc., and the French groups 'Madeleines,' 'Galandes' and 'Mignonnes,' preserve a record of this geographical extension.

We find a good list of Peaches of the sixteenth century in the Italian MATTHIOLI'S Commentaries, published in 1554. There were the red-, white-, green- and yellow-fleshed varieties; the red being like the 'Sanguinole' of Italy to-day in having a red juice and a red flesh. We find the 'Duracinas' or Cling-stones, and the 'Pesca noce' or Nut Peach which may well be our Nectarine.

It is evident that horticulture since the days of PLINY had done little to increase the varieties of Peaches, but it was perhaps a triumph, in the difficult days which had elapsed, that the number should have been maintained.

From the year 1600 France took the horticultural lead in Europe, and so the Peaches were largely French for several centuries, indeed until the nineteenth century, when England and America entered the lists as raisers.

The Peach in Italy.

The Peach flourished in Italy in Renaissance days, and in that climate it may well have continued to propagate itself after the fall of Rome by means of seed.

We find a very early representation of a Peach, or perhaps a Nectarine, in the bas-reliefs which surround the famous bronze doors of Ghiberti at the Baptistery in Florence (fig. 24). As all the fruits, plants and birds are natural size, we can accept it as an exact copy of the Peach early in the fifteenth century.

The Peach is often found in pictures of the Renaissance period in the garlands of fruit so favoured by Squarcione and his pupils, following, it is said, the Grecian festoons of fruits and flowers.

Crivelli, in his later works, rejoiced to paint fruits and vegetables with the minute detail we associate with the Dutch masters. His 'Immaculate Conception' in the National Gallery shows a large-sized Peach. The Bronzino ceiling in the chapel of St. Mark in the Palazzo Vecchio at Florence preserves an unexpected record of pomological history. All kinds of fruits are here piled up in the greatest profusion in the dividing panels of the dome—large Peaches (fig. 25), bigger than Lemons; and, curiously enough, the elongated Grape, known in England as 'Lady's Finger' and in Italy as 'Pizutello,' is portrayed, thus taking this variety back to the sixteenth century.

Fruits in sacred pictures had probably a symbolic significance: the Holy Child is shown by Zoppo with a Peach in His hand in his painting at Berlin (Kaiser Friedrich Museum), and in a great number of pictures the Peach or Apple is thus shown. The Apple was associated with the evil fruit of Eden, and probably the Peach, as the Cherry, typified the fruits of Paradise.

The gardening knowledge of Italy passed with many other things to France, and we find that the earliest books of fruit culture in France were translations from Italian.

The Peach in France.

As France led in horticultural matters in the seventeenth and eighteenth centuries, it was in that country that the Peach and Nectarine made most progress.

France has long distinguished the 'cling-stone' Peaches and Nectarines by giving them distinctive names. The free-stone Peach was a 'Pêche,' the cling-stone a 'Pavie.' The free-stone Nectarine was a 'Nectarine,' and the cling-stone a 'Brugnon.'

The name 'Brugnon' is by some derived from the town of Brignoles in Provence, famous also for its 'Prunes de Brignoles.'

'Nectarine' is apparently an English word deriving from nectar; this dates back to 1611, and was adopted in France in the early years of the nineteenth century.

The word 'Pavie' has troubled the philologists: some derive it

from Pavia, others from a Roman word "Pavaier"; the latter I cannot trace in any dictionary at hand. 'Pavie' was used as far back as 1500.

Besides the names for distinct groups of Peaches and Nectarines, there were several very distinct varieties which, so to speak, founded dynasties. The 'Madeleines' are one of the oldest of these families, and were known early in the seventeenth century. The name, according to some authorities, came from the abundant juice, suggesting the tears of the Magdalen.

The feast of this saint comes on July 22, but is considered by LEROY to preclude this Peach having been named from its ripening on that day. Fruits, however, do not always settle down to their final ripening period in their early days—many supposed late fruits have, after a time, become much earlier.

The original 'Madeleine' soon produced some seedlings which greatly resembled it but were earlier or later, and so we soon find the 'Madeleine Hâtive' and 'Madeleine Tardive,' and also a 'Madeleine Rouge.'

Another dynasty was founded by 'Mignonnes,' the 'Grosse' dating back to 1667, if not earlier. Here again we have an 'Early Grosse Mignonne.' These sub-groups are, of course, analogous to our Prune and Gage classes in the Plums, and the 'Reinettes' and 'Calvilles' in Apples.

The history of the Peach in modern France may well be said to begin with the famous catalogue of fruits published by LE LECTIER at Orleans in 1628, and here we find some twenty-seven varieties of Peaches and Nectarines.

The earliest was the 'Avant Pêche Blanc,' a small fruit, hardly larger than a Walnut, ripening in early July.

The progress of the Peach since those days has not, I think, been in any lengthening of its season—our earliest to-day do not ripen before this 'Avant Pêche.' It is in adding size to earliness that we can claim to have surpassed the Peaches of LE LECTIER'S day. That no increase in size has resulted in the nineteen hundred years of cultivation since PLINY'S day, is shown by the illustration from Pompeii (fig. 23).

By importations from Italy, and by raising seedlings, the number of Peaches and Nectarines cultivated in France soon increased, and at the end of the seventeenth century some thirty-eight varieties existed, as against the twenty-seven of LE LECTIER. This number greatly increased in the nineteenth century, and some 400 were catalogued by SIMON LOUIS of Metz in 1876.

THE PEACH AND NECTARINE IN ENGLAND.

As we have seen, the Peach was known in this country in Anglo-Saxon days, and as a common fruit in the fourteenth century. It is not, however, until Elizabethan days that we find records of actual varieties.

In GERARD and PARKINSON we see that France and Italy were the main source of our supply.

The first home-raised Nectarine of which we have record is the 'Elruge,' raised by a nurseryman, Captain GURLE of Hoxton; the name of the fruit is said to have been an anagram, or GURLE spelt backward, with an added e. It would be pleasant to record that the 'Elruge' we grow to-day was this old seventeenth-century variety, but unfortunately the facts will not permit. GURLE's fruit ripened early in August and had different leaves. The origin of our 'Elruge' of to-day I have not discovered.

In the eighteenth century another Nectarine was added to the list—'Fairchild's,' which was introduced in 1722. The raiser was a well-known nurseryman of his day, and is still remembered by the Fairchild sermon, annually preached in Shoreditch parish church.

In 1815 the well-known variety 'Pitmaston Orange' was raised from a seed of the 'Elruge' by Mr. WILLIAMS of Pitmaston, famous also for his 'Pitmaston Duchess' Pear. This variety still stands unsurpassed for flavour.

In 1824 an interesting bud sport occurred in the Nectarine known as 'Hunt's Tawny,' the sport being a giant form of the parent, alike in all respects save size. This was known as 'Hunt's Large Tawny.' Such sudden increase in size from bud sporting is not, I think, infrequent in stone fruits. There are many Peaches bearing the word "Double," notably in France and Holland.

The very small 'Pêche de Troyes' has its "double" form; there was also a 'Double Montagne' and 'Double Swalsh.'

Among Pears also there are several large forms called Double in French lists.

I have actually seen this sporting take place on a Plum, where the terminal bud produced a strong shoot larger than that below it, and the leaves and fruits were also all double size.

These sudden jumps in size quite probably occur in the wild as well as under cultivation, and it is, I think, a mistake to envisage fruits gradually attaining size by small accretions. Many of them have undoubtedly made such sudden increases.

From 1858 onwards the Peach and Nectarine took a great stride forward in England, thanks to the work of THOMAS RIVERS, the famous nurseryman of Sawbridgeworth, and to him, his son and grandson we owe most of the best fruits of to-day. The following list of introductions shows what we owe to the RIVERS family. We include only those still in cultivation to-day.

Nectarines.

1858	Prince of Wales.	1876	Humboldt.
1860	Victoria.	1893	Early Rivers.
1870	Pine Apple.	1897	Cardinal.
1871	Darwin.	1924	John Rivers.

Peaches.

1860	Early Albert.	1875	Condor.
1864	Early Rivers.	1878	Goshawk.
1864	Nectarine Peach.	1881	Sea Eagle.
1865	Dr. Hogg.	1883	Golden Eagle.
1865	Lady Palmerston.	1898	Thomas Rivers.
1865	Prince of Wales.	1901	Duchess of Cornwall.
1865	Princess of Wales.	1902	Duke of York.
1866	Crimson Galande.	1904	Peregrine.
1867	Alexandra Noblesse.	1911	Kestrel.
1875	Albatross.		

The other great event in Peach history began in America and gave us a series of Peaches earlier than any then known in Europe, and the groups are sometimes referred to as American Peaches. Besides their earliness, they have certain distinguishing characters, notably the narrow leaves and weaker growth.

The first to arrive in England was the 'Amsden June,' raised by Mr. AMSDEN of Carthage. Though scarcely ripening in June in our climate, it was welcomed as ripening at least fourteen days earlier than any known European Peach of moderate size.

In 1877 the 'Early Alexander' appeared in the list of the American Pomological Society, and in the same year came 'Waterloo,' raised by HENRY LISK of Waterloo, Seneca, New York.

All of these were welcomed in Europe as great advances in earliness, and it is interesting to note that they were raised in the Northern States of the U.S.A. Was the Peach adapting itself to the shorter northern summers?

A few other raisers in England provided some varieties good enough to remain in our gardens of to-day: 'Late Devonian,' from Messrs. VEITCH of Exeter (1894); 'Barrington,' named after its raiser of Burwood, Surrey; 'Salwey,' raised by Colonel SALWEY from an Italian variety about 1850; and 'Walburton Admirable,' raised by Mr. MORTON of Walburton, Chichester, in 1843, may be mentioned.

In Nectarines we have 'Hardwicke,' from Hardwicke House, Bury St. Edmunds, alone outstanding beside Messrs. RIVERS'S varieties.

THE PEACH IN AMERICA.

The history of the Peach in America is too long a story to tell here. It found in Mexico and the United States a climate exactly suited to it, and for a long while it was propagated entirely from seed, and so thousands of new varieties sprang up, and, indeed, the Peach became naturalized in both North and South America. Readers of HUDSON'S books on the Argentine will recall his description of the "wild" Peaches growing there.

The Peach certainly arrived in Mexico before 1571 and received Spanish-Aztec names, such as 'Cuztic-duranzo' and 'Xocotl-melo-

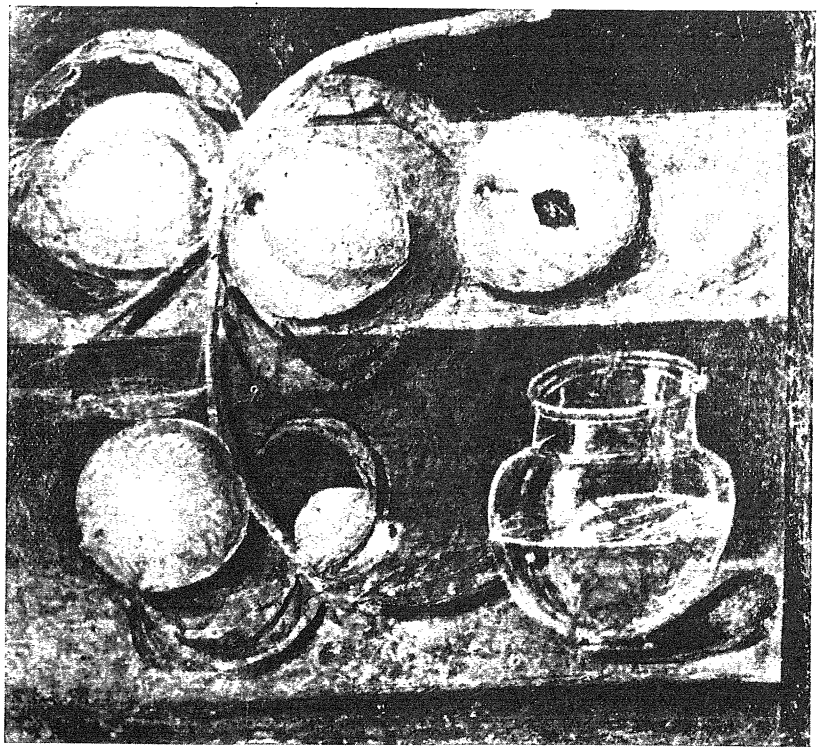


FIG. 23.—PEACH SHOWN ON FRESCO FROM POMPEII.

[*To face p.* 120.

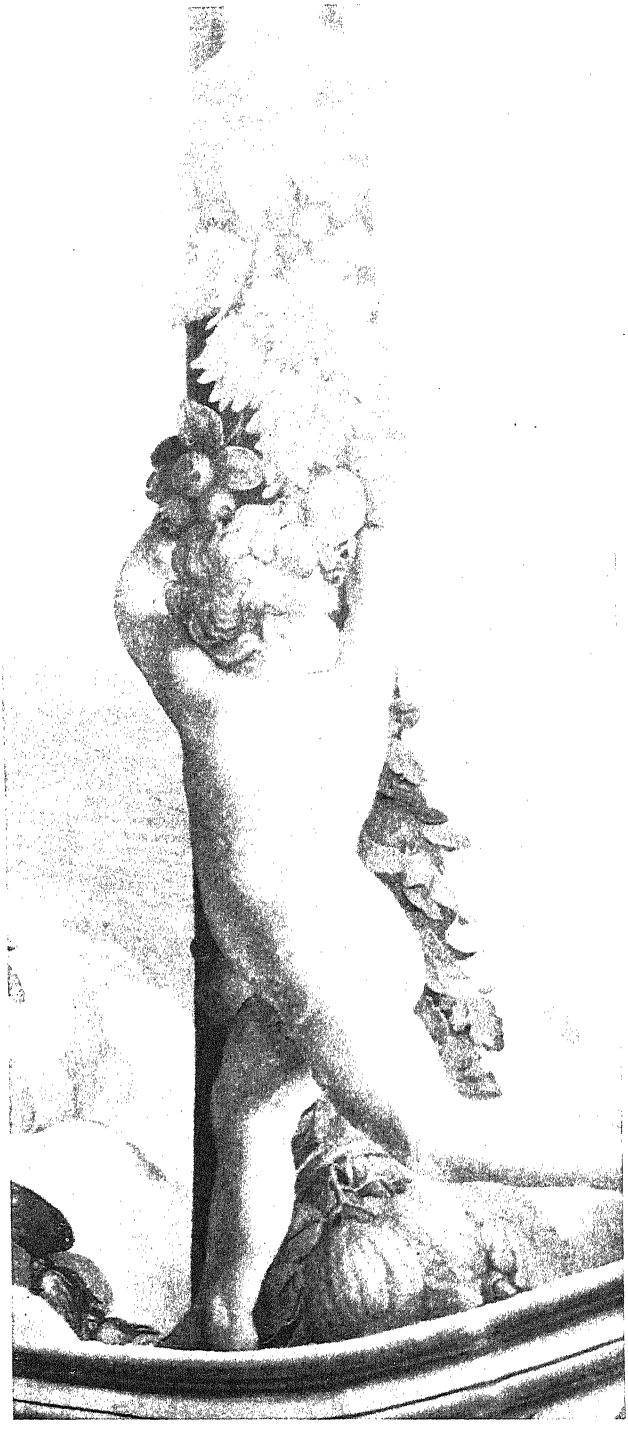


FIG. 24.—BRONZINO'S PAINTING AT THE PALAZZO VECCHIO, FLORENCE. (PEACHES AT TOP.)

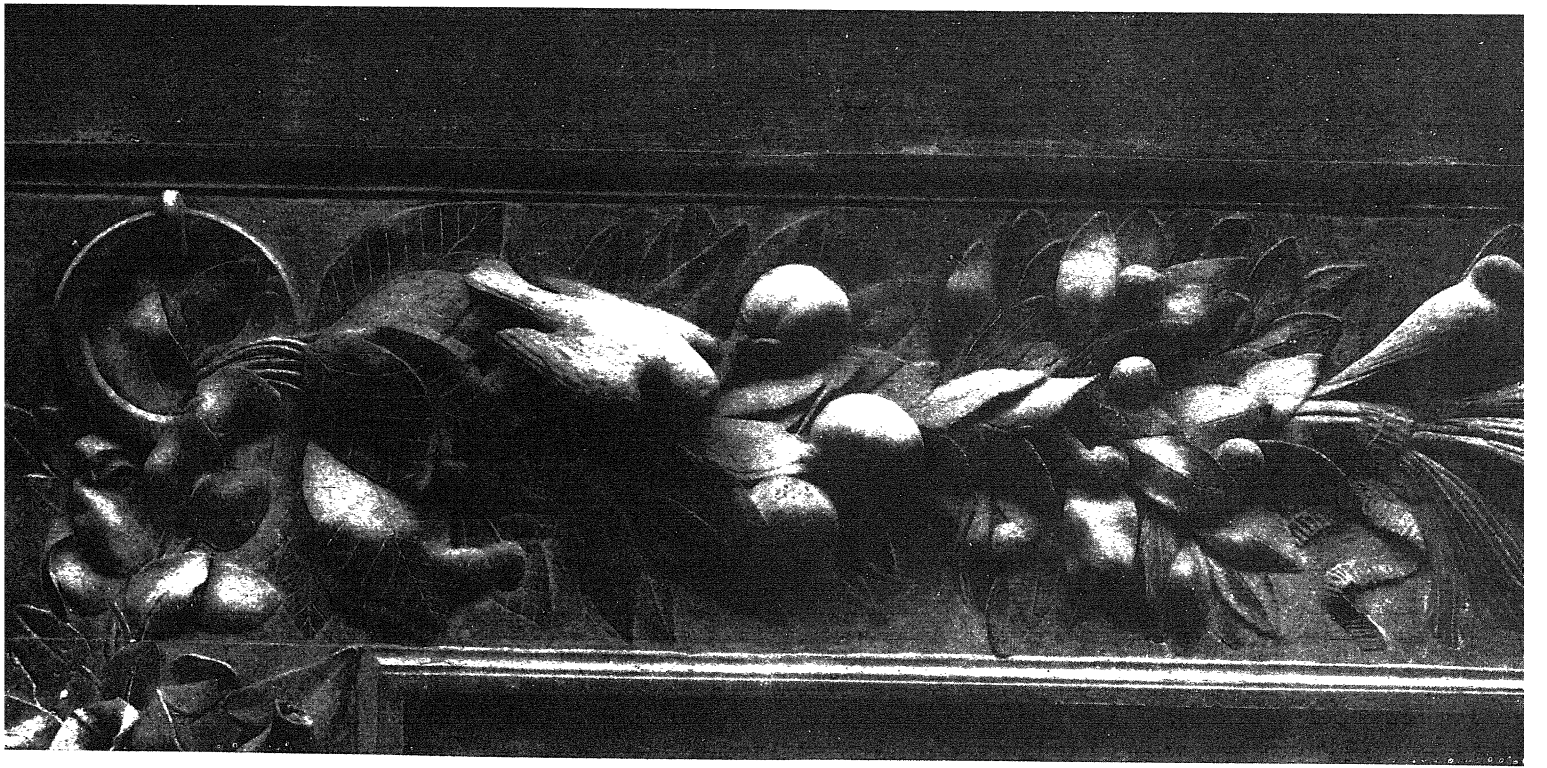


FIG. 25.—PEACH AND OTHER FRUITS SHOWN IN GHIBERTI'S BRONZES AT FLORENCE (ABOUT 1440).



FIG. 26.—STREPTOCARPUS 'MERTON GIANT.'
(p. 138)

[*To face p.* 121.

coton,' in which we see the old Roman names 'Duracina' and 'Melocoton' still persisting in the sixteenth century.

Fuller details of American Peach history will be found in The Peaches of New York, by Professor U. P. HEDRICK.

THE CLASSIFICATIONS OF PEACHES AND NECTARINES.

These fruits would seem to have been created to encourage the systematic pomologist, who finds it so difficult in other fruits to find sharply cut differences upon which to establish his groups and classes. The surface of the skin, smooth or downy, the freedom of the flesh from the stone, or the reverse, the flowers, large or small, offer every help to the systematist.

It is curious that a most distinctive foliage character, the glands of the leaves, was not noticed until 1810, and it is to M. DESPREZ of France that we owe this discovery. These glands may be round or kidney shape, and are, in some cases, entirely absent. No other fruit is therefore so easily classified on paper. In practice certain difficulties, however, present themselves.

It sometimes occurs that these characters may be identical in two Peaches whose only distinguishing character is the time of ripening. Thus four very early Peaches, 'Amsden June,' 'Early Alexander,' 'Hale's Early' and 'Early Alfred,' all have large flowers and round glands on the leaf. 'Alexandra Noblesse' and 'Grosse Mignonne' have round-glanded leaves and large flowers and can be separated only by the fruit.

Great vigilance has therefore to be exercised in the nursery, as Peaches and Nectarines rarely fruit in the open on young trees. It is necessary to grow stock plants under glass and fruit them to maintain a true stock.

WRITINGS ON THE ROSE.—I.

By H. R. DARLINGTON, M.A., F.L.S.

[Read November 9, 1937; Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair.]

IN this review of the literature of the Rose I do not propose to concern myself with the writers of the classical period. The often-quoted paragraph in the Sixth Book of THEOPHRASTUS's Enquiry into Plants, and its expansion by the younger PLINY are well known, and form the earliest attempts to reduce the cult of the Rose to method, and the numerous references to the flower in classical writers are mentioned at greater or less length in all the larger works on the Rose dealing with the history of the subject.

The latest work to deal with the Rose in classical times is Mr. E. A. BUNYARD'S little book on Old Garden Roses (1936), which gives a good and popular account of the flower in this period. One subject which has aroused some interest in our day is the attempt to identify the twelve varieties mentioned by PLINY with the Roses we now know, and Mr. BUNYARD makes a valiant attempt to identify ten of these varieties.

* * * * *

After the German hordes from the north and east had swept over Europe, and ultimately put an end to the Roman Empire, literature of all kinds became scanty and that relating to the garden for a time disappeared. We are indebted to the Hon. ALICIA AMHERST (Lady ROCKLEY) for tracing its gradual revival in her History of Gardening in England (1896), which has already become a classic in garden literature; and this has been followed by Miss E. S. ROHDE in her charming book, The Story of the Garden (1932), and Mr. R. WRIGHT in his book under the same title (1934). It is worth while from these sources to trace the matters bearing on the subject of the Rose.

CHARLEMAGNE was perhaps no great gardener, but was an efficient estate agent, and in his Capitulare de Villis he set out the plants to be cultivated in his gardens. These included only two flowering plants, as we should now regard them, Roses and Lilies. The date of the Capitulare is given as A.D. 812, two years before CHARLEMAGNE's death.

During these troublous times the Rose doubtless retired to the shelter of the monastic garden, an important feature of which was the Herbarium, or Herbaris, or Herb Garden, and it was in this part of the garden, in virtue of its medicinal qualities (as to which the importance will appear later), that the Rose was grown. WALAFRID STRABO (807–849), Abbot of Reichenau, a botanist and physician, has left a series of

poems he calls "Hortulus," or his Little Garden, in which he describes his favourite plants, which again include Roses and Lilies.

The recognized authorities during this period for the treatment of bodily ailments and for the preparation and prescription of medicines for their cure were to be found among the monks. The general division of the monastery garden was threefold: the orchard, the vineyard, and the herb garden; and the herb garden was often placed near the infirmary or quarters of the sick, near the doctor's office, and so that the sick could look out on it. The Rose doubtless originally found a place there on account of its virtues, or medicinal qualities, but was also used for the adornment of the churches and for the making of chaplets for the priests which were worn on great occasions.

The fame of the monastery garden for its Roses is illustrated by the story of King WILLIAM RUFUS (1087–1100) who, desiring to obtain an interview with a lady (afterwards the wife of HENRY I) who was being educated at the convent of Romsey where her aunt CHRISTINA was Abbess, alleged, as an excuse for his visit, his desire to look at her Roses and other flowering herbs, which he seems to have satisfied, and he afterwards left the convent without attaining the object of his visit.

It was thus the monks who became the earliest writers on gardens. They drew their matter to a large extent from the classical writers. The Herbarium of APULEIUS (fourth century) was brought out as the Leech Book of Bald in the fifteenth century by a Saxon doctor and became popular, as did PALLADIUS's De Re Rustica (probably fifth century), and were used for this purpose, the writers otherwise trusting rather to their imagination than their observation.

ALEXANDER NECHAM (1157–1217), a Benedictine monk of the Abbey of St. Albans, and later an Augustine who became Abbot of Chichester in 1213, wrote two books: De Laudibus Divinae Sapientiae, a poem in ten books, of which the seventh is concerned with herbs and fruits, and De Naturis Rerum, which deals with the laying out of gardens. He gives a list of both possible and impossible plants which should be grown in a noble garden and says it should be adorned with Roses and Lilies and also mentions other flowers and herbs.

A somewhat important treatise is the De Proprietatibus Rerum of BARTHOLOMAEUS ANGLICUS, an Englishman of the family of the Earls of Sussex, and a member of the Moscovite Order. It was first printed at Basle about 1470 and went through fourteen editions before 1500, and was translated into English, French, Spanish and Dutch. As there is said to have been an English translation in 1398 it must have been written considerably earlier. His seventeenth book deals with herbs, and the section on the Rose is longer than most. Miss E. S. ROHDE quotes:

"The rose of gardens is planted and sette and tylthed as a vyne. . . . The tame rose hath many leuys sette nye togyder: and ben all red, other almost white: w^t^ wonder good smell. . . . And the more they ben brused and broken: the vertuouser they ben and the better smellynge. . . . She arayeth her thorn wyth fayr colour and good smell . . .

and whane they ben full growen they sprede theymselues ayenst the sonne rysynge. . . . Among all the floures of the worlde the floure of the rose is cheyf and beeryth the pryse. And by cause of vertues and swete smelle and savour. For by fayrnesse they fede the syghte: and playseth the smelle by odour, the touch by softe handlynge."

The writings of the monks on the subject of Roses which we possess must be admitted to be scanty, but it is probable that large quantities of the monastic manuscripts were lost or destroyed at the dissolution of the monasteries, no provision having been made for their preservation. A suggestion of some such provision seems to have been made to Queen MARY by Dr. JOHN DEE, but unfortunately was not acted on. It is therefore still possible, if unlikely, that some further writings dealing with the subject may even now be found in some unexpected quarter, though, owing to the preference of the monks for tradition rather than observation, the likelihood of finding any original work on the subject seems remote.

A manuscript of the fifteenth century, known as the Porkington Treatise, describes how to find a red Rose on the Cherry, and to raise Roses from seed.

The Feate of Gardening was a treatise in verse by "Mayster Jon Gardener," and a copy, written about 1440, is in the Library of Trinity College, Cambridge. Lady ROCKLEY tells us it is the earliest known really original work on gardening written in English, and that among the plants dealt with is the Rose. She has also found a book of Cookery Receipts of the Fifteenth Century, in which "Herbes for a Salade" include prime Rose buds, and among "Herbes to Stylle" is the red Rose.

Of the early English poets of this period, GOWER refers to the Rose but seldom, and then in a conventional manner, but CHAUCER is full of Roses. A translation into English verse of The Romaunt of the Rose is published with his works, of which probably he wrote the first 1700 lines. The French original is an allegory on the Art of Love begun by GUILLAUME DI LORRIS in the latter half of the thirteenth century and continued by JEAN DE MEUNG in the early part of the fourteenth century. The poet is taken by Dame Idleness to the Palace of Pleasure where he meets Love, Sweet Looks, Riches, Jollity, and others who take him to a bed of roses, where he chooses one and tries to pluck it, when he is overthrown by an arrow from Cupid's bow. When he recovers consciousness he is alone and resolves to return to his rose, and the remainder of the poem is taken up with his attempts to do so, and the obstructions he meets, but he is, in the second part of the poem, ultimately successful.

The importance of the Romaunt of the Rose lies in this, that it gives the palace garden as an alternative to the monastic garden where the Rose was cultivated in this early period. The garden, described by the poet:

> "Enclosed was and walled well
> With high walles embatailled."

The poet was attracted by the singing of birds in the garden, but found some difficulty in obtaining admission :

" Till that I found a wicket small
So shut that I ne might in gon
And other entré was there noon,"

careful protection being doubtless the main necessity. He describes the garden and its fruit and other trees " set 5 or 6 fathoms apart " and its wells, and then he comes to

" A roser chargid fulle of roses
That with a hegge aboute enclosid is,"

and after referring to the savour of the Roses sweet, considers gathering one, and we get what must, I think, be the first recorded observation on the life of the cut Rose.

" Of knoppes* clos some sawe I there,
And some wel better woxen were,
And some the ben of other moysoun
That drowe nigh to her sesoun
And spedde hem faste for to sprede ;
I love welle sich roses rede ;
For brode roses and open also
Ben passed in a day or two,
But knoppes wille freshe be
Two days atte least or thre,"

which corresponds very much with our experience to-day of cut Roses in water.

Besides the palace garden, no doubt the Rose might sometimes find a home within the small enclosure of the medieval castle.

There was, however, a third situation in which the Rose was preserved and that was in the town garden, and it seems there must have been some market for cut flowers in the towns, for Lady ROCKLEY has unearthed the accounts of the Sergeant of the Bishop of Lincoln's garden in Holborn, which was apparently carried on for profit, and these include an item of 3*s*. 2*d*. for the sale of Roses.

Sources of Information.—The first treatises dealing entirely with the subject of the Rose began to appear in the middle of the sixteenth century, and as a guide to the works that had appeared down to the beginning of the nineteenth century we have an excellent bibliography prepared by the French botanist THORY in 1818, and printed in Vol. I of the Folio Edition of REDOUTÉ'S Les Roses. This list contains some 245 entries, many of which, however, relate to works of a general character containing longer or shorter references to Roses. Omitting these, it is to this, with some assistance from Mr. P. BOITARD'S

* Buds.

book, published in 1826, that I am mainly indebted for the names of works set out in the first list at the end of this article which contains the works published before the end of the eighteenth century.

The second list given there contains books published since the beginning of the nineteenth century. For these I am largely indebted to various library catalogues, and the books in the libraries of the R.H.S. and the National Rose Society, and in part to the Bibliographia de la Rosa by D. MARIANO VERGARA published in Madrid in 1892. There is also a valuable bibliography of the botanical section of the subject printed in Miss WILLMOTT'S Genus Rosa, 1910.

The third contains a list of the principal papers on the subject of Roses that have appeared in this JOURNAL in recent years.

Early Treatises of the Rose.—It is not till we come to the sixteenth century that we find treatises wholly devoted to the Rose, and for these we are indebted to the doctors, the successors of the monks in the study of medicinal herbs. There were three of these treatises during this sixteenth century. The first is a work entitled De Rosa et partibus Ejus (Madrid, 1551), by NICHOLAS MONARD or MONARDES, a Spanish doctor who lived at Seville. It is devoted to the medical aspect of the Rose, and was thought so well of by the well-known botanist CLUSIUS (CHARLES DE L'ESCLUSE) that it was published by him, in a Latin version, in his Exoticorum (1605), in which form it may readily be consulted. MONARDES wrote other medical treatises on herbs, particularly those of the West Indies, in his Joyfull News of the newe founde Worlde, 1569, translated into English by JOHN FRAMPTON and published in 1577 and 1596. MONARDES was the first to describe tobacco and its uses.

MONARDES'S Treatise was followed six years later (1557) by FUMANELLUS'S Treatise De Rosarum partiumque et omnium quae ex Rosis fiunt facilitatibus, and JULIUS CAESAR SCALIGER'S Rosa subspinosa.

I have found nothing as to FUMANELLUS, except that another edition was published in 1592. Of J. C. SCALIGER (1484–1558), however, we know a good deal. At the age of twelve he was placed by his kinsman the Emperor MAXIMILIAN among his pages. SCALIGER remained in the Emperor's service for seventeen years, distinguishing himself as a soldier, and also studying with success under ALBRECHT DURER.

After this, while living with another relative at the Castle of Vico Nuovo in Piedmont, he divided his time between military expeditions in the summer and the study of medicine and natural history in the winter until invalided by rheumatic gout, after which he devoted himself wholly to study and settled at Agen where he became physician to the Bishop and carried on the practice of medicine with such success that he was said, at his death, to hold the highest scientific and literary reputation of any man in Europe. In 1551 the mathematician and physician GIROLAMO CARDAU published a work called De subtilitate Rerum, an attempt to explain natural phenomena which obtained a

European reputation. SCALIGER, who was a master of invective, attacked CARDAU'S work in a number of Exercitationes, which went through many editions and long continued a popular text-book. It is among these Essays that SCALIGER'S treatise on the Rose appears.

At the beginning of the seventeenth century appeared WITTICHUS'S Rhodographia or description of the Rose (1604), and SYLVIUS'S Oratio de Rosis (1607), and then a curious book by a German, J. C. ROSENBERG, in Latin, called Rhodologia seu generosae Rosae descriptio. The first part deals with references to the Rose in writings from the earliest times, and the second, containing 250 pages, treats of the medicinal value of the Rose, which is regarded as a panacea for every known disease and effectual to drive off evil spirits, and winds up with the story of the resurrection of the Rose like the Phœnix from its ashes. The first edition was published in 1620, another in 1628, and an enlarged edition in 1631.

To carry on the story of the doctors: About the middle of the seventeenth century a number of German doctors collaborated to bring out a magazine under the title of Miscellanea Curiosa Ephemeridium Physico Medica of the Academia Caesaria Naturae Curiosorum. The papers are in Latin and for the most part consist of treatises on medical and surgical subjects, but from time to time there appear short papers on the Rose, or subjects connected therewith. Through the courtesy of the librarian of the Royal Society I have been enabled to examine these early treatises of which, down to the year 1706, I have found nine, the last one by Dr. HOTTINGER containing an illustration of the semi-double red Rose. Dr. GRASSIUS had sown seeds of *Rosa centifolia* and noted that he had got some with few petals (*paucifolias*) among his seedlings. Another learned doctor, Dr. MAJOR, had examined the glands of the Rose under his microscope in an endeavour to discover something as to the fragrance of the Rose; and Dr. PAULLINUS discourses on the familiar combination, De lilis et rosis.

The Herbals.—As the Rose found its way into the monastic herbarium largely through its medicinal properties, so, and for similar reasons, it took a prominent place in the Herbals.

In BANCKES' Herbal (1525) a herbal is defined as "that which showeth and treateth of the virtues and properties of Herbs," and in ASKHAM'S edition (1550) recipes are given for several preparations to be made from Roses.

I do not know "the Grete Herbal" of PETER TREVERIS (1516), but GERARD'S Herbal is a notable event in the history of Rose literature.

JOHN GERARD came of a Lancashire family and was born at Nantwich in Cheshire in 1545. At the age of seventeen he was apprenticed to a barber surgeon in London, and in 1569 he was admitted to the freedom of the Barber Surgeon's Company. His garden was in Fetter Lane, but he also, at least for some time, superintended the gardens of Theobald's in Hertfordshire and Lord BURLEIGH'S garden in the Strand. He published his Herbal in 1596 and died in 1612. A second edition of the Herbal was published (with some additions) by

THOMAS JOHNSON in 1633 (which is the copy I possess), and this was reprinted in 1636. Quite recently (1927) Mr. MARCUS WOODWARD has brought out a reduced edition, retaining only the parts he considered the best and most characteristic passages of the original, and with only a few of the illustrations.

GERARD begins his third book with the Rose; he had a high opinion of Roses, which he thought it had been more fit to have placed with the most glorious flowers of the world, "than to insert the same here among base and thorny shrubs, for the rose doth deserve the chiefest and most principal place among all flowers whatsoever." He divides Roses into eighteen kinds, which are separated into three groups. The first group consists of (1) the White Rose, (2) the Red Rose, (3) the Damask Rose (these two are indistinguishable in the illustration), (4) the lesser Province Rose, (5) the Rose without prickles, and (6) the great Holland Rose.

The Roses of this group are perhaps separated from the rest by reason of their "vertues," which are set out at length separately lettered and number twenty-eight. The second group is that of the Musk Roses. These are eight in number and include, curiously enough, the "velvet rose" and *Rosa lutea*. The "vertues" of this group number but three.

The third group are the Wild Roses, of which he knew four. The single and double Sweet Brier, the Brier or Hep Rose (*R. canina*), and the Pimpernell or Burnet Rose. The habitat he gives for the Burnet Rose is Grays in Essex and a "pasture as you go from a village hard by London called Knightsbridge into Fulham."

Passing over several of these old herbals and general works*, we come to the last of the great herbalists, JOHN PARKINSON (1567–1650). His garden was in Long Acre and he was a friend of JOHN TRADESCANT and THOMAS JOHNSON, who edited GERARD, and he practised as an apothecary. The book that ensured his fame is his Paradisi in sole Paradisus terrestris, or Garden of Pleasant Flowers as he aptly calls it, for it is a garden book as we should call it. It was published in 1629, a second edition appeared in 1656 and a facsimile reprint in 1904. It is interesting as one of the first serious attempts to get away from the medical aspect of the Rose, that portion relating to the virtues of the Rose being reduced to a paragraph of a few lines. PARKINSON, however, made up for this omission in his Theatrum Botanicum (1640), where the medical properties of the Rose are developed at greater length.

As a general proposition it may be stated that the medical properties of the Rose take an important part of all the treatises of the seventeenth century, Dr. HAGENDORN'S Cynosbatologia, towards the end of the century, being entirely devoted to this aspect of the subject,

* The following all contain references at greater or less length to Roses: WILLIAM TURNER'S Herbal (1538); HILL'S Profitable Art of Gardening (1568); SWEERT'S Florilegium (1612); Hortus Eystetensis (1613); PASSAEUS Hortus Floridus (1614); WILLIAM LAWSON'S New Orchard and Garden (1618); BAUHIN'S Historia Plantarum (1619); REA'S Flora (1665).

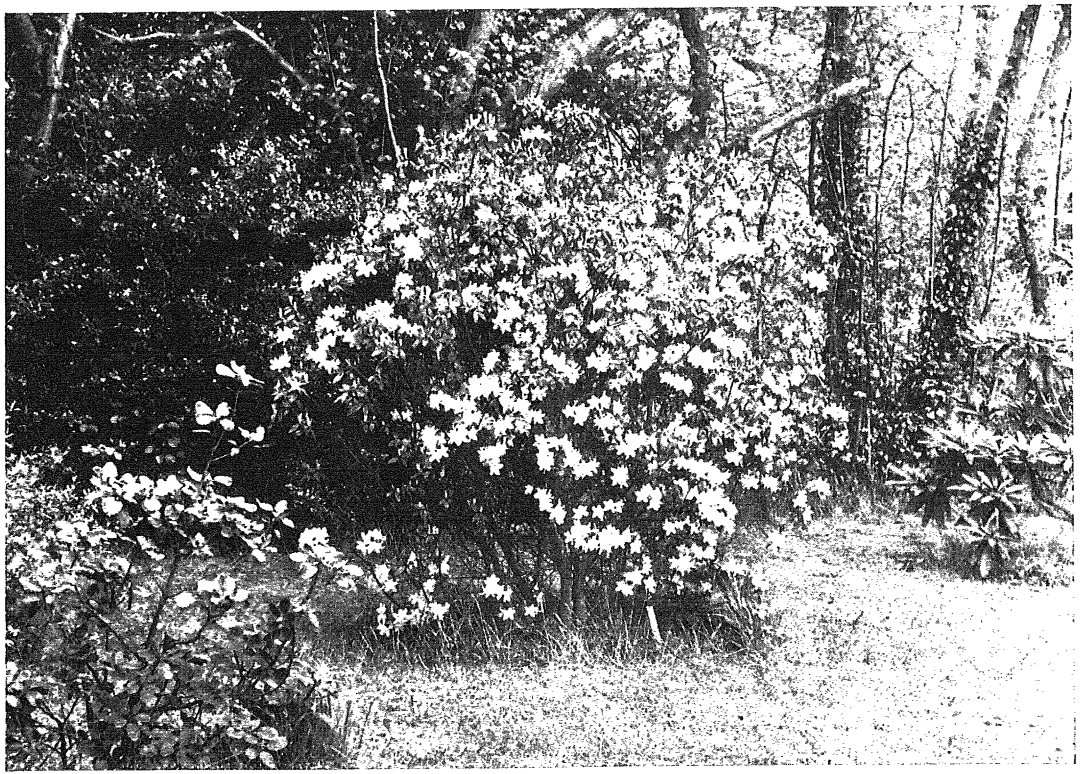


FIG. 27.—RHODODENDRON VILLOSUM AT WISLEY.



FIG. 28.—CYPRIPEDIUM CALCEOLUS GROWING WILD IN AUSTRIA.
(p. 141)

[*To face p.* 129.

and the same may be said of the half-dozen or so treatises recorded for the first half of the eighteenth century.

This is scarcely surprising, for it was a time of great stir and advance in the medical world. In 1543 VESALIUS at Padau had published his Fabric of the Human Body, which is regarded as the foundation of modern scientific medicine, and in 1638 HARVEY published his discovery of the circulation of the blood. The Society of Apothecaries was founded in 1606 and obtained its first charter in 1617. New drugs were being sought for, and the historian tells us * that the increased interest in gardening enabled new medicines to be concocted.

It is therefore not surprising that the Rose, which, as we have seen, obtained its entry into the monk's herbarium largely through its medicinal properties, should have appealed to the writers of the period, and particularly to the doctors, for similar reasons.

Linnaeus and the Local Floras.—In 1735 LINNAEUS published his Systema Naturae. This was but a few pages, but it was edited over and over again, the thirteenth edition, in three volumes, appearing in 1788; and in 1753 appeared his Species Plantarum. These, and the school of botanists whom he collected round him, produced a profound effect on the study of botany, and the whole world was the scene of this inquiry.

REDOUTÉ gives us a list of some one hundred local floras, in all of which the Rose plays a greater or less part. Most of these appeared in the second half of the eighteenth and early years of the nineteenth centuries. They range from THUNBERG'S Japan (1784) and LOUREIRO'S (Flora Cochin chinensis, 1790) through India, very numerous districts in Europe, to North America, where the treatises of WANGENHEIN (1781), MARSHALL (1785), MICHAUX (1803), and PURSH (1814) may be mentioned. Besides these he gives us, for the same period, some fifty general works on plants, all containing articles or sections of greater or less importance on the Rose. These include the Hortus Kewensis of JOHN HILL (1768), and AITON (1789 and 1810), and MILLER'S Gardener's Dictionary (1724), for over one hundred years the bible of gardeners; CURTIS'S Botanical Magazine, begun in 1787, and such celebrated works as JUSSIEU'S Genera Plantarum (1789), KERNER'S Hortus Sempervirens (1795), and SERINGE'S (1818).

Turning to the works more particularly devoted to the Rose during the second half of the eighteenth century, perhaps the most important is the Essay on the Rose by the Marquis D'ORBESSAN, read before the Academy of Science in Toulouse in 1752, and printed in Paris in 1768, inaugurating as it does a new era in Rose literature, in which less attention is paid to the medical value of the Rose and greater consideration is given to its cultivation and beauty in the garden. This was followed shortly afterwards by the publication of J. HERRMANN'S Dissertatio de Rosa, printed in Strasbourg in 1762, in which is to be found an early attempt at the classification of the species and varieties.

* DAVIES, The Early Stuarts, p. 362.

Other works of about this period are LOISELEUR DESLONGCHAMPS'S Monograph in DUHAMEL'S Traité des arbres, Ed. 2 (180–1) ; a note by PALLAS on *Rosa berberifolia* (now *R. persica*) (1792), ROBERT BROWN'S Genus Rosa in the Hortus Kewensis, Ed. 2, and the century fittingly winds up with Miss LAWRANCE'S beautiful Collection of Roses from Nature (1799). This consists of illustrations of ninety varieties of garden Roses, delicately and vividly portrayed, and four pages of text giving a botanical classification, which is now perhaps obsolete. The charming wreath of Roses which formed the frontispiece is well known, and has been reproduced over and over again.

Botanical Writings.—It may be convenient here to say something of the botanical literature of the Rose, and in this connexion I am disposed to class those great works on the Rose by REDOUTÉ and Miss WILLMOTT among the garden rather than the scientific literature. In both cases the text was mainly contributed by scientific botanists, and both are of botanical value, but the text is written to the plates of REDOUTÉ and in Miss WILLMOTT'S case to those by ALFRED PARSONS, and that classification which is the general object of a monograph, though no doubt careful and useful, is, one feels, of secondary importance.

LINNAEUS, in his Species Plantarum (Ed. 3, 1764), designated only 14 species of Rosa and, as he relied for distinguishing characters on the oval or rounded forms of the fruit, which were subsequently found to be too variable characters for specific distinction, these virtually became reduced to 12 species.

The extraordinary attention which the genus received in the very numerous local and other floras which have been mentioned resulted in the number of so-called species described by the authors becoming so great as to be confusing and unmanageable, and it became necessary to endeavour to classify them and reduce them to order.

HERRMANN'S Treatise, De Rosa (1762), had attempted some classification and was followed by D'ORBESSAN'S Essay (1768), and much was done towards elucidation of the species by J. WOOD'S Synopsis of British Species of Rosa (1816) and RAU'S Enumeratio (1816), but it was reserved for Dr. LINDLEY in his Rosarum Monographia (1820)—written when quite a young man—to reduce to order the mass of species and varieties that had been described by their authors and to construct an intelligible and workable classification of the genus.

LINDLEY admitted 76 species, arranged in 11 divisions, to which he added some 25 more uncertain or doubtful species. It was an intelligible and practical arrangement, and if sufficient allowance is made for the Roses known at the time has scarcely been improved.

Of TRATTINNICK'S four volumes, Rosacearum Monographia (1823), the first two deal with Roses, the third and fourth including Rubus, Potentilla and other members of the order. He criticizes the extravagant multiplication of species, but he nevertheless enumerates some 670 species and varieties which he arranges in 24 series.

Later (1877) DÉSÉGLISE published his Catalogue Raisonné, in

which he admitted 405 species arranged in 15 sections—a useful work.

The multiplication of names and descriptions of new forms proceeded during the century and perhaps reached its acme when GANDOGER, in 1881, published his Tabulae Rhodologicae, which was a dichotomous key to 4,266 varieties of Roses, arranged in 12 groups.

FRANÇOIS CRÉPIN deplored the waste of time and money on this portentous work by a man he otherwise respected. CRÉPIN had no patience with those who, he declared, would find several species of Rose on the same bush, and whom he called "Bush Maniacs," a feat which, according to Miss ERLANSON, has recently been repeated by a writer or writers on the Roses of America.

CRÉPIN had published a manual of the Belgian Flora in 1860. In 1870 he became attached to the Natural History Museum at Brussels and six years later head of the Brussels Botanic Garden, a position he held till his retirement in 1901. His first paper on Roses was published in 1866, entitled Studies in Roses, a review of certain varieties of *R. canina*. His Primitiae Monographiae Rosarum, or Materials for the History of the Rose, was published in six parts from 1869 to 1882. He gave to this Society in 1889 a sketch of a new classification of Roses, and besides many papers a year on various aspects of the subject he produced an important work on Hybrid Roses in 1894. LINDLEY had long before pointed out that botanists were acquainted with every variation from *R. canina* to *R. tomentosa*, and CRÉPIN carried the series on to *R. villosa*. Again, between such different forms as *R. canina* and *R. spinosissima*, there was a similar but less continuous series. In such circumstances it seemed absurd that every variation in minor characters should constitute a fresh species. Could an inquiry into hybrids elucidate the difficulty? His inquiry must be considered inconclusive, and he probably would not have accepted modern deductions from his method, but it undoubtedly led the way to the simplification of the taxonomy of the Rose.

In 1879 CRÉPIN began his rhodological excursions to the Alps, which were continued at least till 1894, and about 1889 he seems to have commenced his collection of herbarium specimens of Roses, which ultimately became the most complete in the world and which he bequeathed to the Brussels Botanic Garden. He died in 1903, but his work has been carried on by G. A. BOULENGER, who has made a most elaborate study of this herbarium collection (which fortunately escaped damage during the war). This investigation has extended over some twenty years, and BOULENGER has now published the result of his studies in the Journal of the Brussels Botanic Garden (vols. **9, 10, 12, 13** and **14**). These publications are not obtainable by the public, but are to be found in the libraries of this Society and of the Linnean Society, and it is much to be hoped that at least a careful résumé of the results attained should be published in an accessible form.

In BOULENGER'S work the European Roses occupy two volumes,

and another three volumes contain the Asiatic Roses. He has reduced the European Roses to 10 species and the Asiatic to 93 species; while Miss E. W. ERLANSON has made an inquiry on similar lines into American Roses, which she has determined at 18 species, making a total of 121 for the world.

In these inquiries the assistance of the cytologists, and in particular Major HURST'S papers on Chromosomes and Characters in Rosa (1925), and Differential Polyploidy (1927), have not been neglected, but though they have helped they have not seriously affected the system of classification worked out by CRÉPIN and others on morphological lines.

The modern view seems to be that the number of species conveniently recognized in the Genus Rosa is relatively small, and that the innumerable intermediate forms should be considered as hybrid, or minor variations. Whether these forms can be most conveniently described by a number or by retaining the old names with the prefix × seems undetermined, and perhaps may depend on the taste of the botanist.

British Roses.—Meanwhile the investigation of our indigenous Wild Roses has not been neglected.

In 1816 SABINE published a review of the Scotch Roses and in 1818 JOSEPH WOODS his Synopsis of the British species of Rosa enumerating 25 species. In 1869 J. G. BAKER gave his Monograph on the British Roses, recognizing 13 species.

In 1894 CRÉPIN had asked for a new Monograph on British Roses and this was supplied by Colonel A. H. WOLLEY-DOD, who in 1908 published his British Roses, in 1911 his List of British Roses, and in 1924 The Roses of Britain, which to some extent reviewed his previous work. He recognized 43 separate species and hybrids as well as numerous varieties. If we subtract the 27 of these which he marks as hybrids this would leave 16 species, some of which, *e.g. R. glauca* and *R. coriifolia*, BOULENGER has treated as hybrid or minor varieties.

(*To be continued.*)

SOME EXPERIMENTS IN ASPARAGUS CULTIVATION.

THE genesis of these experiments was described in the JOURNAL R.H.S. **59**, p. 74, where the first results are reported. A further report giving the results of cutting in 1933–4–5 was printed in vol. **60**, p. 452. The results obtained in 1936 and 1937 are now recorded.

The experiments were, until he left Wisley in March 1936, in charge of Mr. A. N. RAWES, since then of Mr. J. M. S. POTTER, by whom the figures now added were secured.

It should perhaps be said that the system of cultivation detailed on p. 75 of the first report has been followed all along.

I. CROPPING OF MALE AND FEMALE PLANTS:

Variety 'Connover's Colossal.'

The first of the experiments relates to the comparative yields of male and female plants, the variety used being 'Connover's Colossal.' The planting has indeed become a demonstration rather than an experiment, as will be seen from the further figures now available. The earlier reports showed in the first three cuttings an increase of nearly 60 per cent. in the yield of the male plants over the female, and the records of the past two seasons confirm this.

The beds from which comparisons can be made are in three series, as it was also desired to test the effect of different spacing of plants. Thus in 1936, from the 273 male plants 6,639, and from the 273 female plants (under precisely the same conditions) 4,297 saleable stems were cut; *i.e.* the yield of the male plants was 54 per cent. above the female. While in 1937 from the same male plants the total cut was 5,675 saleable stems against 3,792 from the female, being 49 per cent. in favour of the male.

If the yields of the male and the female plants over the five years of cutting are compared we have, male plants 26,588 saleable stems, and female 16,927, *i.e.* 57 per cent. in favour of the male. These results have been confirmed by other trials elsewhere.

It appears, therefore, that if male plants only are planted the yield may be expected to be half as much again as if female plants only are planted, with the added advantage that there are no seedlings to interfere with the cropping of the established plants; or if the yield of male plants only be compared with the usual mixed planting, the advantage of planting male plants will be about 20 to 25 per cent. increase, achieved at no greater expense save that entailed by selecting male plants for the original planting.

II. PLANTING DISTANCES.

The second object of the experiments was to try to settle the question of the best distance for planting, one upon which many differences of opinion had been expressed. The beds from which the

Series A. 'CONNOVER'S COLOSSAL.'

Male Plants.

	Planting Distance.	Area. Sq. yds.	No. of Plants in Bed.	1933.	1934.	1935.	1936.	1937.*	Average Annual No. of Stems from a square yard.	Average Annual No. of Stems from a Crown.
Bed No. 1 . .	3 ft. × 2 ft.	52	64	688	1105	1109	1299	1190	20·7	16·8
,, ,, 3 . .	3 ft. × 2 ft.	52	64	761	1208	1220	1376	1213	22·2 } 21·6	18·1 } 17·6
,, ,, 5 . .	3 ft. × 2 ft.	52	64	798	1215	1205	1420	1069	21·9	17·8
,, ,, 16 . .	4 ft. × 2 ft.	48	48	570	1062	1104	1430	1229	22·5	22·5
,, ,, 18 . .	4 ft. × 3 ft.	48	33	421	889	919	1114	974	18·0	26·1

Series B. 'CONNOVER'S COLOSSAL.'

Female Plants.

	Planting Distance.	Area. Sq. yds.	No. of Plants in Bed.	1933.	1934.	1935.	1936.	1937.*	Average Annual No. of Stems from a square yard.	Average Annual No. of Stems from a Crown.
Bed No. 2 . .	3 ft. × 2 ft.	52	64	421	713	709	903	818	13·7	11·1
,, ,, 4 . .	3 ft. × 2 ft.	52	64	505	702	698	925	845	14·1 } 13·7	11·5 } 11·2
,, ,, 6 . .	3 ft. × 2 ft.	52	64	453	717	693	875	760	13·4	10·9
,, ,, 17 . .	4 ft. × 2 ft.	48	48	370	578	672	785	665	12·8	12·8
,, ,, 19 . .	4 ft. × 3 ft.	48	33	343	580	684	809	704	13·0	19·0

* The fall in yield was due to bad weather.

foregoing figures are derived planted with 'Connover's Colossal' help to answer the question, and in addition several beds of the variety 'Harwood's Giant' planted next to these have given valuable figures. The beds of 'Harwood's Giant' each contained both male and female plants. There are thus three series of plantings for consideration on this point.

Series C. 'HARWOOD'S GIANT.'

Mixed Plants.

	No. of Plants in Bed.	Area of Bed in sq. yds.	Planting Distance.	Total No. of Stems cut in 5 years.	Yearly average No. cut from a square yard.	Yearly average No. cut from a Crown.
Bed No. 7	48	48	4 ft. × 2 ft.	3475	14·4 } 15·7	14·4 } 15·7
,, ,, 13	48	48	4 ft. × 2 ft.	4024	16·8 }	16·8 }
,, ,, 8	66	40	3 ft. × 1½ ft.	3887	19·4 } 18·7	11·4 } 11·6
,, ,, 12	66	40	3 ft. × 1½ ft.	3598	18·0 }	11·9 }
,, ,, 9	88	44	2 double rows 1½ ft. apart, with 4 ft. space. Plants 1½ ft. apart in rows	3959	18·0 } 18·0	9·0 } 9·0
,, ,, 11	88	44	(As No. 9)	3929	18·0 }	9·0 }
,, ,, 10	132	52	2 treble rows 15 in. apart with 4 ft. space. Plants 1½ ft. apart in rows	4374	16·8	6·6
,, ,, 14	33	48	4 ft. × 3 ft.	2778	11·6	16·8
,, ,, 15	33	40	3 ft. × 3 ft.	2998	15·0	18·2

Examination of these figures shows that the cropping from the different beds was in the same order in each year.

In Series A there was little difference in yield from an equal area between the 3 ft. × 2 ft. and the 4 ft. × 2 ft. planting and both were higher than that from the 4 ft. × 3 ft. planting. In Series B the highest yield from a given area was from the 3 ft. × 2 ft. planting. In Series C the highest yield from a given area was from the 3 ft. × 1½ ft. planting, and the rather closer planting in beds 9 and 11 gave somewhat less. The much closer planting in bed 10 gave a markedly lower yield, and so did the wider plantings 4 ft. × 2 ft., 4 ft. × 3 ft., and 3 ft. × 3 ft., the widest planting being the least satisfactory. The general result seems to point to the most economical planting distance for Asparagus being rows 3 feet apart with plants 18 inches to 2 feet apart.

In every series with one small exception the largest average yield from a plant was given by the widest planting, and the smallest by the closest. This is the common experience with other plants. Up to a point the greater the space available the greater the development reached by the plant, but this does not mean that it is better to provide a very wide planting space. There is a point at which the wide planting becomes uneconomical, as the present series of plantings shows.

A NEW ACTIVITY FOR HORTICULTURAL SOCIETIES.

By HAROLD MAYALL.
(Hon. Secretary of the Highcliffe and District Horticultural Society.)

IT seems almost an impossible thing that children should grow up without seeing flowers and without any knowledge of them, yet this is actually the case in very many parts of London. It is with this in mind that the following account of a branch of work that this Society is doing may be of interest to Secretaries of Horticultural Societies within a reasonable radius of London. We are exactly one hundred miles away.

It happened in this way. Some time ago I came across an account of a scheme known as the League of Flower Givers, started by Mrs. TURVILL of The Pleasaunce, Woldingham, Surrey, in 1934, after an appeal in *The Times* for surplus flowers to be sent to schools in the London area. This work has grown very rapidly, and flowers are being sent not only to schools, but to refuges, orphanages and rescue homes in many districts where flowers are hardly ever seen ; but although it has grown it only touches the fringe of what could be done.

There are about a thousand poor schools in the London area, and it occurred to me that a horticultural society such as this one at Highcliffe, situated in the midst of many beautiful gardens and comprising many professional gardeners and amateurs, might quite easily, with a little organization, send flowers regularly to one of the schools. Having got into touch with the organizer of the scheme, we "adopted" a school, to which the nearest open space in any direction is a mile away, and where the children, over six hundred of them, hardly see flowers at all, except at funerals.

The way the scheme is worked is as follows : on Monday mornings flowers are delivered at the Village Hall ; we have a rota of givers, some with large gardens sending once a week, some twice a month, some once, so that it does not become a burden on any one giver ; the flowers are placed immediately in water to help them travel ; in the afternoon they are packed, and we have a rota of packers so that this work only comes at most once a month on each of them. Then they are sent by express to London, arriving on Tuesday morning, so that the school and the children may have the benefit of them for the week. The scheme is simplicity itself, and since we began we have never failed to send weekly.

I believe that we are the only horticultural society that is doing this, at any rate in connexion with this scheme, but it is obviously a way that many horticultural societies, much larger than our own,

could help to bring beauty and colour into many colourless places, and a great deal of joy to many lives who have really very little of it. The headmistress of the school to which we send tells me that Tuesday, the day on which the flowers arrive, has been, since we began, the Red Letter Day of the week. The cost is very little, and most societies could manage this. It is quite easy to get suitable flower hampers, these come back to us by return to be ready for refilling the next week. We pay the carriage both ways.

Certain flowers, such as Roses, are not suitable for this purpose, but there are very many that are, and that will easily, if cut at the proper stage, last the week. In the spring, Daffodils, Anemones, Polyanthus, Tulips, Lilies—then later Marigolds, Erigerons, many annuals, Pinks, Carnations and quite a lot of the smaller herbaceous flowers, and later still Chrysanthemums and some types of Dahlias. In winter we cannot send so much, but it is always possible to get some greenhouse blooms from the bigger houses to keep the supply going. The joy they give is enormous, apart from the good effect it all has on the mind of the child, and the cost of giving it is trifling.

If any other horticultural societies wish to follow this lead, I shall be glad to give any further information about what we do, or this can easily be obtained from the organizer, who would put them in touch with some school where they are most needed, and of which she has a very long waiting list.

PLANTS TO WHICH AWARDS HAVE BEEN MADE.

Brassocattleya × Vilmoriniana var. 'Zeecrabbe.' **A.M.** January 25, 1938. This showy hybrid is noteworthy for the uniform rosy-mauve of all the segments. The wide labellum is crisped at the margin and has a greenish-gold central area. The spike bore three flowers. The result of crossing *Brassocattleya* × 'Mrs. J. Leemann' with *Cattleya Mossiae*. Exhibited by Messrs. Sanders, St. Albans.

Miltonia × 'Melina.' **A.M.** January 11, 1938. An attractive hybrid obtained by crossing *M.* × 'Mrs. J. B. Crum' with *M.* × 'Memoria H. T. Pitt.' The sepals and petals are rich crimson, the labellum deep rosy-mauve. Exhibited by Messrs. McBean, Cooksbridge.

Narcissus Bulbocodium Romieuxii. **A.M.** January 25, 1938. Shown by Major F. C. Stern, F.L.S., Goring-by-Sea. A form of *Narcissus Bulbocodium* from Morocco, about 5 inches high, with creamy-yellow flowers and protruding anthers.

Odontoglossum × 'Princess Juliana.' **A.M.** January 25, 1938. The spike bore eleven well-formed rich reddish-crimson flowers. The labellum has a white marginal area and a yellow crest. The result of crossing *O.* × 'Palmyras Queen' with *O.* × 'Purple Emperor.' Shown by Messrs. Charlesworth, Haywards Heath.

Sophrolaeliocattleya × 'Anzac,' Orchidhurst var. **F.C.C.** January 11, 1938. The special feature of this hybrid is the beautiful rosy-crimson of the sepals and petals, and the ruby-crimson of the labellum, the last having gold veining in the throat area. It is the result of crossing *Laeliocattleya* × *Dominiana* with *Sophrolaeliocattleya* × 'Carminetta.' Exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

***Streptocarpus 'Merton Giant.'** **A.M.** October 29, 1937. From John Innes Horticultural Institution, Merton Park. Plant produces one or two leaves, 15 to 18 inches long, 7 to 12 inches wide, dark green. Flower stems 12 to 18 inches tall, branched towards the apex, each branch being either one- or two-flowered; sixteen to twenty flowers on a stem, five to seven flower stems to a plant, produced in succession. Flowers single, 1¾ inch diameter, tube 1½ inch long, clear lavender violet-blue, throat creamy white, varies somewhat in shade, margins of petals crenate. Raised by the sender as the result of a cross between *S. grandis* and a blue garden hybrid.

* After trial at Wisley.

CHRYSANTHEMUM 'FAVOURITE' SPORTS TRIED AT WISLEY.

THE well-known Chrysanthemum 'Favourite,' which was given an Award of Merit in 1920 when shown by Messrs. GODFREY, when the flowers were described as pure white, is subject to sporting both in colour and form, and several sports have been propagated and named. Some confusion in the naming having occurred from the same or similar sports having arisen and been propagated in different nurseries under different names, it was determined to carry out a comparative trial of these sports from several different sources. They were collected and grown in the manner recommended by Mr. THOMAS STEVENSON, which was as follows :

" Chrysanthemum 'Favourite' should, I think, be grown quite naturally till the first bud appears, then after breaking they should be disbudded, leaving the three top shoots, allowing them to grow naturally till they again break, when they should be allowed to carry twelve to the shoots, on which they should be allowed to flower. This should give the crop of bloom, which will probably be at its best the first or second week in December. Fairly liberal treatment should be given after becoming well rooted in the flowering pots—which should be 9-inch (16's)."

Twenty-six stocks were received for trial, and they were judged by the Committee on September 12, 1937, when awards were recommended as shown below.

In all varieties the plants were about 4 feet 6 inches in height and of compact growth, the flower stems being 15 to 18 inches long. Except where mentioned the flowers were 4 to 5 inches across.

DESCRIPTIONS AND NOTES.

Flowers White.

White Favourite (raised by Messrs. W. J. Godfrey and sent by Mr. F. Davison of Kenilworth). **A.M.** December 9, 1937.—Flowers white ; florets long, of medium width, compact, inner incurved, outer reflexed. A true even stock.

Incurved White Favourite (raised and sent by Messrs. A. G. Vinten of Balcombe, Sussex ; also sent by Mr. F. Davison). **H.C.** December 9, 1937.—Flowers 4 to 4½ inches diameter, white ; florets long, broad, incurved.

Flowers Golden-yellow.

Golden Favourite (raised by Messrs. A. G. Vinten and sent by Mr. F. Davison). **A.M.** December 9, 1937.—Flowers clear bright golden-

yellow ; florets long, of medium width, compact, inner incurved, outer reflexed. A true even stock.

INCURVED GOLDEN FAVOURITE (Sapsford).—Mixed.

Flowers Silvery-pink.

Silvery-Pink Favourite (sent by Batchlor's Nurseries, Marston Green, nr. Birmingham, and Messrs. E. & J. J. Paragreen, Thurlaston, nr. Leicester). **A.M.** December 9, 1937.—Flowers 4 to 5½ inches diameter, silvery-pink ; florets long, broad, inner incurved, outer somewhat reflexed. Stocks true.

Flowers Mauve-pink.

Deep Pink Favourite (sent by Messrs. A. G. Vinten and Mr. F. Davison). **H.C.** December 9, 1937.—Flowers mauve-pink, reverse of florets silvery-pink ; florets long, of medium width, inner incurved, outer reflexed. Messrs. Vinten's stock was of a slightly paler shade than that from Mr. F. Davison.

Flowers Rose-pink.

Rose-Pink Favourite (raised and sent by Messrs. G. W. Sapsford of Pevensey, Sussex). **H.C.** December 9, 1937.—Flowers deep rose-pink, reverse of florets whitish ; florets long, of medium width, outer reflexed.

Flowers Old Rose.

ROSE FAVOURITE (W. H. Cole).—Character of ' White Favourite,' but flowers old rose, reverse dull cream ; very variable in shade ; not fixed.

RED FAVOURITE (W. H. Cole).—Very similar to ' Rose Favourite.' Stock not fixed.

OLD ROSE FAVOURITE (J. A. Macleay).—Mixed.

Flowers Light Apricot.

Favourite Supreme (raised and sent by Messrs. A. G. Vinten). **H.C.** December 9, 1937.—Flowers light apricot tinged pink, inner florets light apricot, reverse light cream ; florets long, of medium width, inner incurved, outer reflexed. A true stock.

LIGHT BRONZE FAVOURITE (C. A. Richards).—Character of ' Favourite Supreme,' but flowers pinkish-apricot ; inner florets of a yellowish shade. Colour washy.

BRONZE FAVOURITE (Sapsford).—Like ' Light Bronze Favourite.' Colour washy.

SALMON FAVOURITE (Sapsford).—Very much like ' Light Bronze Favourite.' Colour washy.

BRONZE FAVOURITE (Davison).—Very much like ' Favourite Supreme,' but flowers salmon-apricot, with a lighter centre.

SALMON-BRONZE FAVOURITE (W. H. Cole).—Mixed.

PEACH FAVOURITE (W. H. Cole).—Mixed.

UNNAMED (Paragreen).—Mixed.

Flowers Light Bronze.

Amber Favourite (sent by Messrs. A. G. Vinten and Mr. W. H. Cole). **A.M.** December 9, 1937.—Flowers bright amber, inner florets of a

brighter and yellower shade; florets long, of medium width, outer slightly reflexed.

Bronze Favourite (raised and sent by Mr. J. A. Macleay of Ayr). **H.C.** December 9, 1937.—Plant of 'Amber Favourite' habit, but with light bronze flowers; reverse of florets amber.

ORANGE-BRONZE FAVOURITE (Beckwith).—Very similar to 'Bronze Favourite,' but with somewhat deeper coloured flowers.

Flowers Reddish-bronze.

DEEP BRONZE FAVOURITE (Beckwith).—Flowers reddish-bronze, reverse of florets light amber; florets long, of medium width, outer reflexed.

CYPRIPEDIUM CALCEOLUS.

THE European Lady's Slipper was illustrated in the JOURNAL R.H.S. **57,** p. 353, as it grows in the chalky soil of Major F. C. STERN's garden at Highdown, Goring-by-Sea, Sussex, and in vol. **59,** p. 472, as it grows in the very different soil of Dr. STOKER's garden at Golding's Hill, Loughton, Essex. By the kindness of Mrs. H. K. GRIFFITH, of "Roydon," Asheldon Road, Torquay, who took the photograph, we are now able to illustrate (fig. 28) a plant of this fine hardy species growing wild in the Austrian Tyrol in June 1937, and bearing thirty-six flowers.

BOOK REVIEWS.

"The Epicure's Companion." By Edward and Lorna Bunyard. 8vo. xiii + 539 pp. (Dent, London, 1937.) 7*s*. 6*d*.

In his latest book Mr. Bunyard, assisted by able friends, has again given us another of those ironic and witty treatises which readers of his "Anatomy of Dessert" would expect. The present volume is so filled with good things—not only gastronomical—that one is tempted to quote *ad lib*., and excite the reader's mental appetite as well as his gastric juices to a high degree of stimulation. There is a vast store of classical knowledge, of culinary expertness, and of humour in these 528 pages, and I thoroughly enjoyed the excursion into such varying provinces. It is amazing to learn how early, in the existence of this planet anyhow, that cooking started to be an art. In the fourteenth century there were cookery books, one in 1370, another in 1390, and, needless to say, they emanated from France—that land of the gourmet. In the "Ménagier de Paris" the porpoise is mentioned as an edible fish, also the "Grampus or Whale," though the latter would, I expect, be painfully reminiscent of tonics with cod-liver oil in their make-up. In 1456 the cook of Charles VII of France dilated on soups, and Mr. Bunyard quotes at length the ingredients thereof. He tells us that Joan of Arc, when preparing to raise the siege of Orleans, fortified herself with "Soupe au vin," and Du Guesclin did the same; as the author says, it is possible that in both cases this drinking of soup may have had some sacramental significance.

Taking a leap through the ages we come to twenty-four years before the fall of the Bastille, when Boulanger was the first to open a "restaurant" "as a quiet place of entertainment for ladies unaccompanied by gentlemen." This and the succeeding restaurants were strictly regulated by law, and only more or less invalid foods were permitted. What a change in the present day, when invalid cookery is hardly what one looks for—or, thank goodness, finds—in the restaurants of great cities. There is a gentle slap of Mr. Bunyard's at the watery soup of the ultra refined—both culinary and moral—days of Queen Victoria, when all the goodness had been "cleared" from the soup.

Next comes fish, with interesting statistics of the value of our fishing industry, for, as he says, "the history of the trade is part of the history of England itself," as well we know, when we recall what the trawlers did for this country in the gallant and dangerous parts they played from 1914 to 1918. To the fish list he adds their seasons, services and French names. From fish, through meat, we reach vegetables, and learn that, in the days of Athenaeus, Asparagus came from Libya, where it grew twelve feet long. Pepys enjoyed it—but possibly not of that length—in 1667. Of the homely cabbage we learn that its ancestry is honourable and long in Greece, Rome and Egypt, where there exists a legend that it was an antidote to over-indulgence in wine. The cucumber goes far back into Mediterranean history, having been known to the Egyptians, Greeks, Hebrews, and, according to Pallidus, it was supposed to be sensitive to thunder, "curling up like a snail" when there was a storm. I think I must have cucumber ancestry, as thunder has much the same effect on me. Tiberius ordered cucumbers for every meal. What a digestion he must have had! Jerusalem Artichokes have no connexion with Jerusalem, but came originally from Brazil, and Champlain in Canada recorded eating some curious roots of plants with sunflower-like seeds, which undoubtedly were our old friend the Jerusalem Artichoke, since they would have reached the northern latitudes from Brazil, even in those days. But it was the botanist Goodyer who first sampled them in Europe, and certainly his account of them is not calculated to encourage their eating, for he says crudely, "In my judgement, which way soever they be drest and eaten they stirre and cause a filthie loathsome wind within the body, causing the belly to be pained and tormented and are a meat more fit for swine than man." They were also called "the potatoes of Canada" by Parkinson in 1619, though he gave the poor things a more cheerful reputation as being a dish "fit for a Queen." Lettuce was known in Persia in 500 B.C.; the Greeks also knew it, and most other countries of Europe. The same applies to the Onion, only here there is a glimpse of it in the days of Cheops, builder of the Pyramid that bears his name, and the onion tribe in the shape of garlic was deified—"Kitchen garden gods," as Juvenal called them.

Of the Potato, Mr. Bunyard declares that Raleigh did not first bring it from

Virginia, and according to him, "if any single European deserves the honour of its discovery it must be Pizarro, whose conquest of Peru in 1532 opened the door to Spain, and to Spain must be given the honour of first cultivating it in Europe." His description of the manner of eating Maize in North America made me chuckle, "The principle of the lathe is adopted in eating it." Well do I remember the disgust on my husband's face when in Canada his staff guzzled on "Sweet Corn," their faces smeared with butter, and an expression of gastronomic content in their eyes.

Right through the list of everything edible does this most compact volume take us, and here is one delightful note: "The mouse was accounted excellent medicine in the Middle Ages, but it has now fallen into disuse. Cheese-fed mice, like peach-fed hogs, might be worth a trial." There is another hint on salad oil: "A teaspoonful a day, taken with vegetables in the course of daily meals, will calm the trouble of many a storm-tossed digestion and make the world a better place for the brief dwelling of man." The account of pies and pasties shows that they did themselves well in the Middle Ages. Of spices we learn that in China (*c.* 266 B.C.) officers of the court were required to hold cloves in their mouths when in audience with their Emperor. I wish some people in the modern world would keep cloves between their lips when talking into one's face. Regarding Pepper there is a store of information, dating from A.D. 978. In 1284 "one pound of mace cost as much as three sheep."

Next come fruits, and now I agree with Mr. Bunyard's diatribe against the banana. "It was designed as the staple food of the negroid races," he says, and "I can only attribute to it—the increased consumption of bananas—the present negroid characteristics, the love of the garish, of cacophony as against music, the spread of the herd spirit and the fear of solitude—all these find their dietetic expression in the flaccid banana of commerce." Personally, though I have tried to eat bananas in their native land, I cannot say that there is much difference between them in the West Indies and the "flaccid banana of commerce" offered at home. The description of the first appearance of the banana in London on a hot August day in 1627 is excellent, though too long to quote, but I cannot refrain from the description of it given in 1829 by Jacquemont as "jasmine-scented pomade gone rancid and much sweetened."

From fruit he drifts to buns and cakes, tracing the latter from 625 B.C. onwards through the ages, among them the "same cakes, marked with the crooked staff of Astarte, the sign of the cross, are still eaten by the faithful and faithless alike on Good Friday." In this chapter there are most interesting details of cakes pertaining to various festivals such as sheep-shearing, and the quaint tale of the "Oublies," whose vendors the "Oublayers," were incorporated as early as 1270 in France.

In Part II of the book there is less of Mr. Bunyard and more of fable and song in favour of drink, of its correct temperature, vintages, etc., with a valuable table of details as to nomenclature, etc. This section includes spirits as well as wines, coffee, tea, cider and "soft drinks," so that the teetotaller cannot reproach Mr. Bunyard as a wine-bibber, though his friends know what a discriminating palate he has for drink as well as food. There follows "An Epicure's Anthology," which contains all manner of quaint "conceits" and quotations, with, for instance, lists of the food and drink supplied in the Percy household, dealing with what "my Lord Percy and my lady had for braikfaste" and what was provided in the "nurcy" for Lady Margaret and "maister" Ingeram Percy. None of them starved apparently. There is an entertaining item in the "Regulation for the King's (Henry VIII) House," in which it is laid down that "The officers of the bedchamber will agree among themselves and will never divulge the Royal pastimes." Just as well, considering the King's propensities. It continues, "They will not caress the maids on the stairs, as many household utensils are apt to be broken as a result." So the handmaid of to-day with her smashing propensities has a long run of ancestresses to copy—which she does with great faithfulness, as any housewife knows to her cost.

"A fishery is a great nursery for the Navy, and should never lack goodly encouragement," as Thomas Nash wrote with far-seeing wisdom in 1599.

"Hot houses for raising fruit, and ice chests are thought to have been introduced into England about the time of Charles II, for at a banquet given at Windsor on the 23rd April, 1667, at an installation of Knights of the Garter, strawberries, cherries and ice-cream were served."

I have no more space left for further quotations from this most interesting, witty and informative book, and so I strongly advise all who are interested in food—not merely as a means of keeping body and soul together, but as a history of manners and customs in days gone by—to purchase and send it forth.

EVELYN BYNG OF VIMY.

"The Garden Book: an Anthology for all who love Gardens." By A. Lamplugh. 8vo. 245 pp. (Jenkins, London, 1937.) 7*s.* 6*d.*

The author has "gathered together in the smallest possible compass passages from some of the best books about gardens." She has drawn from writers both of poetry and prose. Humour is not disdained, even informative writers are quoted, and, though some charming and familiar passages may be looked for in vain, passages equally charming and new to many of us will be met.

A list of authors quoted and an index of first lines of poetry and rhymes assist the reader who wishes to dip into the book here and there or to find a favourite passage.

"Overseas Plant Products." By J. H. Holland. 8vo. vii + 270 pp. (Bale & Curnow, 1937.) 6*s.*

This is an index of plants which are, for the most part, put to some commercial use. The plan will be seen from the following extract:

> "MAHWA (MOWRA or MOWA)—*Madhuca latifolia* (*Bassia latifolia*) (Sapotaceae); India—Central Provinces; seed or kernels exported to Europe for the extraction of oil—the residue used as a manure or for dressing lawns and golf-greens to destroy worms. A spirit is distilled from the flowers in India. *Madhuca longifolia* (*Bassia longifolia*) of Southern India, known as 'Illupei' or 'Illupi,' produces a similar oil-seed of importance in the trade."

The author, who was for some time on the staff of the Museums of the Royal Botanic Gardens, Kew, has given us a very useful dictionary.

"The Gardener's First Year." By Alfred Bates. 8vo. x + 246 pp. (Longmans, Green, London, 1936.) $2.

"The Gardener's Second Year." By Alfred Bates. 8vo. x + 278 pp. (Longmans, Green, London, 1937.) $2.

The first of these books is written in simple language and it deals with elementary things and for the most part explains them very plainly. The plants dealt with are annuals suitable for the American garden (for these books were written in America).

The second book continues the story in a more advanced way and deals with garden construction in shaping ground, the making of steps, pavements and so on, and with deep digging. Herbaceous perennials are described and details of their cultivation given.

The two form an excellent and clearly written introduction to the growing of flowers outdoors, and doubtless the "Gardener" envisaged will be encouraged to proceed to the cultivation of fruit and vegetables, and of trees and shrubs for ornaments, and possibly in time to grow plants under glass.

"Early-flowering Chrysanthemums and Indoor Varieties for Cutting." By E. T. Thistlethwaite. 8vo. 80 pp. (Thistlethwaite, 83 Chesterfield Road, Barnet, 1937.) Paper covers, 2*s.*

This is a very practical book dealing with every phase of Early-flowering Chrysanthemum culture by one who has evidently had a very wide experience in the growing of both old and newer varieties. He is a keen observer of the treatment that is necessary to secure the best results from so many different varieties, and has kept such careful records of their requirements that the terse notes on each are such as any tyro cannot fail to understand.

The diagrams of types of flowers, the methods of stopping the plants, taking buds, etc., are all lucid and easy to follow.

It would perhaps have been advisable for the author to have given more advice on the varieties that give the best results grown naturally in sprays without disbudding. The probability is that by far the largest number of amateurs are more interested in such varieties than in those that require disbudding.

Sterilization of the soil with Formaldehyde is recommended (p. 79) when it has become infested with eelworm. It is doubtful, however, if there is any definite proof that such treatment will effectively eliminate eelworm from the soil.

Professional Chrysanthemum growers and amateurs alike will gain much valuable information from a perusal of its pages.

G. W. LEAK.

" Some Canadian Wild Flowers." By the Lady Rockley, C.B.E. 8vo. xi + 107 pp. (Macmillan, London, 1937.) 6*s*.

This is a reprint of the first part of the author's " Wild Flowers of the Great Dominions," already reviewed in our JOURNAL. The text has been revised and augmented by sundry small additions and a chapter on ferns. It should prove a useful introduction to the flora of Canada, especially for the casual visitor and for those who desire to know something of the more showy plants our gardens owe to that botanically rich land.

" Commercial Apple Growing." By A. H. Hoare, with a Foreword by Dr. H. V. Taylor. Illustrated. 245 pp. (Martin Hopkinson, London, 1937.) 10*s*. net.

The author of this book has had a long acquaintance with commercial apple-growing as an official, and therefore sees the industry from outside rather than from within. This point of view enables him to write about the business as he has seen it carried out by market growers, large and small, in Kent and the Eastern Counties. He gives an account of apple production on modern lines which will be helpful to those who think of entering the ranks of fruit-growers. They will gain a good general idea of the kind of business they are entering upon, of the method of laying out a plantation, and of the annual routine work involved in its maintenance. But they will have to look elsewhere for instruction in such practical operations as pruning, grafting, and packing, for the treatment of such matters is meagre and not always free from errors.

Young men coming fresh into the industry are wisely advised to spend a year or two working on the place of a successful grower to acquire practical knowledge, and then to take a course at one of the agricultural colleges or farm institutes where special attention is given to the scientific principles of fruit-growing. Older men are recommended to work for a year or two as pupils.

In a useful chapter on finance, a subject too often shirked by writers, the beginner is told that he will require capital of roughly £100 an acre to cover the cost of establishing a non-intensive orchard and bringing it to a stage at which it may be expected to yield a working profit.

Advice is given on the choice of soil and situation for apple-growing, and various plans for the lay-out of an orchard are described and illustrated. Interesting examples of existing successful plantations of different sizes are helpful in this connexion. The author's own preference is for a plantation of trees of large bush form on Malling No. I or No. II stock, planted 15 feet to 20 feet apart. He would aim at having 50 acres of trees as a minimum, and would confine himself to dessert varieties. Of these he would plant only two or three free-selling kinds, with any necessary pollinators; and he can see nothing better than ' Worcester Pearmain,' ' Cox's Orange Pippin,' and ' Laxton's Superb.' He prefers the Eastern Counties even to Kent for the production of dessert apples, and would look for land in Suffolk, Norfolk, or Essex. The first-named is, in his view, the best county in England for the purpose.

The manuring of apples is dealt with on sound lines, and there is a helpful chapter on methods of orchard soil management. The control of pests and diseases receives a good deal of attention, modern developments in the technique of spraying being noticed.

Storage is dealt with at some length, descriptions being given of air-cooled, cold, and gas stores.

E. M. BEAR.

" Some Flowers." By V. Sackville West. 8vo. 63 pp. (Cobden-Sanderson, London, 1937.) 5*s*.

An illustrated book of great charm with which any lover of the garden may spend a pleasant hour in reading an account of some five and twenty plants, the flowers of which commend themselves to the author for their shape, colouring, marking or texture. All are worthy of a place in the garden, and the cultural advice given is informative and sound. The illustrations reproduced from photographs of the living plants are excellent, that of *Lilium giganteum* reminding one strongly of the wood at Wisley. Whether *Mutisia retusa* deserves the measure of praise given to it is a matter about which there may be some difference of opinion.

NOTES AND ABSTRACTS.

Begonia Richardsiana T. Moore. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 674).—A species from Pondoland, somewhat like *B. Sutherlandii*, but with much-cut leaves. The flowers are small, few, and nearly white.—*F. J. C.*

Ceropegia plicata. By E. A. Bruce (*Fl. Pl. S. Afr.*, t. 675).—Native of Natal and Transvaal. A twining glabrous species related to *C. Brownii*.—*F. J. C.*

Cyrtanthus Tuckii transvaalensis. By I. C. Verdoorn (*Fl. Pl. S. Afr.*, t. 680).—Found near Pretoria. Flowering in November, with several tubular flowers, bright red throughout at top of a foot long scape.—*F. J. C.*

Eriogonum, The genus. By S. G. Stokes (San Francisco, Calif.; pp. 132; 1937).—Eriogonum is an exclusively American genus, members of which are being tried in this country as rock-garden plants. This revision, based on many years of study of the living plants in western North America and of specimens in herbaria, describes 155 species and many varieties, and correlates morphology with geographical distribution.—*W. T. S.*

Ginkgo biloba, The name, and other names of the tree. By A. C. Moule (*T'oung Pao*, 33, pp. 193–219; illust.; Leiden, 1937).—The word "Ginkgo," put to scientific use by Linnæus in 1771 as the generic name of the "Maidenhair-tree" (*Ginkgo biloba* Linn.), has hitherto been accepted by European botanists as a Chinese or Japanese vernacular name which the German traveller Engelbert Kaempfer (1651–1716) had noted during his visit to Japan about 1690 to 1692. "Gin" can mean "silver," but apparently there is no such sound as "kgo." The Japanese seem acquainted with "Ginkgo" only as a foreign botanical name. In this learned and interesting paper the Professor of Chinese Language and History in the University of Cambridge unravels its history. Its first appearance in print is in Kaempfer's Amoen. Exot. (1712). The word is not, however, to be found in the manuscripts (now in the British Museum, London) written by Kaempfer in Japan. Instead there is the Japanese script for "Sankyō," apparently meaning "hill apricot." Professor Moule concludes that when, many years after his visit to Japan, Kaempfer came to decipher and publish his notes of 1691, he or possibly a helper inadvertently transcribed "Sankyō" as "Ginkjo" or "Ginkgo"! In short, "Ginkgo" appears to be a nonsense name of German origin and not a Chinese or Japanese name at all. Nevertheless, as Professor Moule observes, "this strange word, which is unpronounceable and probably ought never to have existed," for nearly two centuries has been the correct botanical name for this beautiful and interesting tree; "uncouth and barbarous" though it is, the International Rules of Botanical Nomenclature permit no change.

The second part of this paper is mostly concerned with Chinese and Japanese accounts of the tree. Among its many Chinese names, "Yin hsing" (silver apricot), "Pai kuo" (white fruit) and "Ya chiao" (duck foot; in allusion to the leaf-shape) are specially mentioned. Apparently the Ginkgo was unknown in northern China during the centuries when the Chinese classical civilization and language were being formed. It may be indigenous in the forests of Chekiang, South China. In Japan the oldest trees stand near Buddhist temples and are believed to protect them from fire by exuding moisture when scorched by the heat of approaching flames. The Ginkgo is undoubtedly fire-resistant. Many an ancient Ginkgo, blackened and burnt in the great fire of Tokyo in 1923, has since put forth shoots, while trees of other species were completely destroyed.

W. T. S.

Nerine gracilis. By R. A. Dyer (*Fl. Pl. S. Afr.*, t. 679).—A new species with rosy flowers about ½ inch across on slender pedicels. Foliage filiform, about a foot long, produced with the flowers. Flowering in February in Transvaal.—*F. J. C.*

Othonna Heerei Pillans. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 676).—A curious species from Namaqualand, with large brown tubercles crowded on the stems. Flowers small, yellow-rayed.—*F. J. C.*

Pelargonium Bowkeri Harvey. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 671).—A tuberous species with much-cut foliage and several yellow and red flowers in an umbel, the petals being deeply fimbriate. S. Africa.—*F. J. C.*

Pelargonium reniforme Curt. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 672).—A red-flowered species, already figured in Bot. Mag. t. 493.—*F. J. C.*

Petalidium oblongifolium C. B. Cl. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 669; July 1937).—Transvaal, growing in sandy soil. About 3 feet high with numerous lilac flowers about an inch across.—*F. J. C.*

Protea aspera. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 543; April 1937).—An apparently stemless plant with 25 to 30 leaves rising from the ground at the apex of the subterranean branches, bracts brown.—*F. J. C.*

Rhododendron aperantum Balf. f. By J. Hutchinson (*Bot. Mag.*, t. 9507; Jan. 1938).—A spreading species belonging to series Neriiflorum, subseries Sanguineum from North-east Burma, forming a thick mat up to 8 feet across and 3 to 9 inches high; flowers bell-shaped, about 1½ inch long by 1½ inch broad, white to deep crimson, orange or yellow, in trusses of three to five; leaves small, ovate. A plant for the rock-garden.—*M. S.*

Rhododendron Cubittii Hutchinson. By J. Hutchinson (*Bot. Mag.*, t. 9502; Jan. 1938).—A greenhouse shrub from Northern Burma which received an Award of Merit in 1935. See JOURNAL, R.H.S., **60**, 224.—*M. S.*

Scilla saturata Baker. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 674).—Growing wild near Pretoria and elsewhere in S. Africa. Flowers varying from mauve to deep-purple, in a short 20–30 flowered raceme. Scape 5 to 6 inches long. Flowering in spring.—*F. J. C.*

Senecio albanensis DC. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 663; July 1937).—A decorative herb about 18 inches high, with linear lanceolate denticulate leaves and flowers somewhat like those of *Coreopsis Drummondii*. Native of Natal.—*F. J. C.*

Senecio azoides Sch. Bip. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 662; July 1937).—A succulent S. African species of the Kleinia section with small yellowish flowers and long cylindrical leaves.—*F. J. C.*

Senecio Tabacon Turcz. By J. R. Sealy (*Bot. Mag.*, t. 9512; Jan. 1938).—Syn. *S. cervilingua*. A perennial herb of at present doubtful hardiness in England, from the Andes of Colombia and Venezuela, with brillant reddish-purple flowers up to 1½ inch diameter; about 3½ feet high.—*M. S.*

Solanum species of the Old World cultivated by primitive tribes of Africa and Asia [Les espèces de Solanum de l'Ancien Monde cultivées par les peuplades primitives de l'Afrique et de l'Asie]. By Aug. Chevalier (*Ann. Sci. nat., Bot.*, Sér. 10, xix, pp. 73–82; illus.; 1937).—The most important of cultivated Solanums, the potato and the tomato, are American. In the Old World other species of Solanum have long been cultivated for their fruits or foliage by primitive peoples, especially in Africa, and these are reviewed by the author. It is significant of their long domestication that a great number of them are races unknown in a wild state. They group around *S. nigrum*, *S. indicum*, *S. Melongena*, *S. macrocarpon* and *S. aethiopicum*.—*W. T. S.*

Streptocarpus Pole-Evansii. By I. C. Verdoorn (*Fl. Pl. S. Afr.*, t. 678).—A new species from near Barberton with small Lobelia-like flowers. It has several basal leaves and several scapes arise from the base of the oldest successively.
F. J. C.

Streptocarpus Rexii Lindl. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 666; July 1937).—A stemless species, with narrow green leaves and obliquely trumpet-shaped pink flowers.—*F. J. C.*

Stultitia paradoxa. By I. C. Verdoorn (*Fl. Pl. S. Afr.*, t. 677).—A Stapelia with rather small flowers, variegated chocolate. Stem with long teeth. Native in Natal and Portuguese East Africa.—*F. J. C.*

Tripterygium Wilfordii Hook. f. By J. R. Sealy (*Bot. Mag.*, t. 9488; May 1937).—A climbing plant from China, introduced by Forrest, and hardy in Cornwall. This plant has been called *T. Forrestii* and *T. hypoglaucum* (several other synonyms are quoted). It produces axillary clusters and terminal panicles of small white flowers, and in autumn fruits about ½ inch long including the three red wings. The leaves turn to shades of greenish brown in autumn.—*F. J. C.*

Tulbaghia alliacea Linn. f. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 653 ; April 1937).—A well-known bulbous plant with six green perianth segments and a purple corona to which three of the segments are adnate for half their length. Flowers small.—*F. J. C.*

Viburnum foetidum Wall. By F. Ballard (*Bot. Mag.*, t. 9509 ; Jan. 1938).—A hardy shrub from Yunnan and Szechwan, East Bengal, Assam, Manipur, and Upper Burma, up to 9 feet high. Received A.M. in 1934, and described in the JOURNAL, R.H.S., **60**, 87.—*M. S.*

Viscaria atropurpurea Griseb. By W. B. Turrill (*Bot. Mag.*, t. 9489 ; May 1937).—Native of the Balkans. An annual with narrow linear leaves and purple flowers in an elongated racemose inflorescence.—*F. J. C.*

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FORTHCOMING EVENTS.

THE busy season of Flower Shows has now begun in earnest, and there will be something horticultural to see nearly every week right up to the beginning of October.

April starts off with a Fortnightly Show on the 5th and 6th, to be followed by the Daffodil Show on April 12 (1 to 7.30 P.M.) and April 13 (10 A.M. to 5 P.M.) at which, if the favourable weather at the time of writing persists, the rivalry among amateurs and horticultural traders in the competitive classes is likely to be keener than ever. The closing date for entry is April 9. Schedules are obtainable from the Secretary. In the Old Hall, on these dates and at the same times, the Early Market Produce Show will be held. This is always a show of great interest.

On the afternoon of April 12, at 3.30, Monsieur ANDRÉ L. SIMON will talk on " Unusual Vegetables for the Garden and the Cook."

The British Carnation Society's Spring Show will be held on April 20 (1 to 7.30 P.M.) and April 21 (10 A.M. to 5 P.M.) in the New Hall. Fellows' tickets will admit.

On April 26 to 29 the Conference on Flowering Trees and Shrubs (other than Rhododendrons) will be held. It may be as well to outline the programme again. Papers will be read on the following subjects: " Arrangement of Flowering Trees and Shrubs, including their use on Walls, Rock Gardens, etc." ; " Flowering Trees and Shrubs for various Climates and Soils " ; " Other Families of Flowering Trees and Shrubs " ; and special papers on " Cherries, Crabs and their Allies "; " Brooms and the Cistus Family "; " Cotoneasters, Viburnums, and Barberries "; " Lilacs, Philadelphus, Deutzias, Diervillas, Hibiscus, and Escallonias "; " Magnolias and Camellias "; and on " Propagation " and " Pruning." The papers will be illustrated by lantern slides.

There will be a special three-day Show of Flowering Trees and Shrubs in the New Hall, whilst in the Old Hall the usual exhibits of seasonal flowers will be staged. On this occasion there will be two competitions, one for Flowering Trees and Shrubs, arranged as follows:

Class A.—8 varieties of trees and/or shrubs in bloom, 1 vase of each. Rhododendrons and Azaleas excluded.

Class B.—4 varieties of trees and/or shrubs in bloom, 1 vase of each. Rhododendrons and Azaleas excluded.

A competitor may enter in Class A or Class B, but not both.

Class C.—1 vase of a tree or shrub in bloom. Rhododendrons and Azaleas excluded.

A competitor may not exhibit in Class C any plant which he is exhibiting in Class A or Class B.

Class D.—1 vase, pot or tub of a tree or shrub in bloom, species not introduced before 1920. Rhododendrons and Azaleas excluded.

The second competition is for a silver trophy presented by the Orchid Trade for award to the amateur who exhibits the best twenty-five plants of Odontoglossum, species and/or hybrids (see January JOURNAL, p. 34).

A programme of excursions has been arranged for Friday, April 29. The full particulars of the Conference, competitions, excursions and lunch, may be had on application to the Secretary. It would be convenient if Fellows would let the Secretary know as soon as possible of their desires.

On May 3 (1 to 7.30 P.M.) and May 4 (10 A.M. to 5 P.M.) the Rhododendron Association's Show will be held in the New Hall and the Alpine Garden Society's Show in the Old Hall. Fellows' tickets will admit.

On May 10 (12 noon to 7.30 P.M.), and May 11 (10 A.M. to 5 P.M.) there will be a Fortnightly Meeting, at which the second competition for Sewell Medals (see January JOURNAL, p. 31) will be held. On this occasion one medal is offered for an amateur's exhibit and one for a horticultural trader's exhibit. Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than by the first post on Wednesday, May 4.

On the afternoon of May 10, at 3.30, Mr. H. STEVENS of Messrs. Moyses Stevens, Ltd., will speak in the Lecture Room of the New Hall on "Flower Decoration."

The Chelsea Flower Show will be held in the Royal Hospital Gardens from Wednesday, May 25, until Friday, May 27. It is the intention to send again special invitations to all Fellows and Associates so that they may attend the Show from 2 o'clock on the Tuesday afternoon. These special invitations, it is hoped, will be dispatched about ten days before the Show.

In the May JOURNAL there will be circulated, by the kindness of the Automobile Association, a special leaflet regarding the traffic

regulations to be followed on the Tuesday. There will be three entrances to the Show grounds on Tuesday: the main entrance from the Royal Hospital Road, the side entrance on Chelsea Bridge Road, and an entrance from the Embankment. Fellows arriving before 2 o'clock on Tuesday afternoon will find the Chelsea Bridge Road entrance convenient, as they can rest in the Ranelagh Gardens until such time as they can be admitted into the Show grounds. For those arriving after 2 o'clock it would be a great convenience if more use were made of the Embankment entrance so as to relieve the traffic on the Royal Hospital Road. Further particulars of the Chelsea Flower Show will be published in the May number of the JOURNAL.

On April 22 the Old Hall has been let to the National Rose Society for their Spring Show. The Fellow's tickets *do not admit* to this Show but particulars may be obtained from the Secretary of the National Rose Society, 117 Victoria Street, S.W. 1.

The examination work of the Society continues. The written part of the Examination for the National Diploma in Horticulture will be held throughout the country on April 30. The closing date of entry for the Examination for the National Certificate in Elementary Horticultural Practice, for students in Farm Institutes, is May 2. Particulars are obtainable from the Secretary.

GROUP MEETINGS.

The Iris Group Meeting will be held on April 12 in the Restaurant of the Old Hall, at 4.15 P.M., when Mr. R. W. WALLACE will speak on "Irises for the Water Side." On May 10 a Lily Group Meeting will take place in the Restaurant of the Old Hall at 4.30 P.M., and members are invited to put questions on any matter connected with Lilies, Nomocharis or Fritillaries, and arrangements will be made for the questions to be answered as far as possible.

WILD FLOWER EXHIBITS AT LOCAL SHOWS.

The Wild Flower Conservation Board of the Council for the Preservation of Rural England has asked us to draw the attention of Affiliated Societies and indeed of all our Fellows to a few simple rules which might well govern arrangements for exhibits of wild flowers by children at local flower shows. They are as follows:

1. The exhibits should consist of (say) twelve different named specimens.
2. The specimens *must not include the root* and should, if possible, show leaf as well as flowers.
3. Plants that are known to be uncommon locally should be forbidden. (The local committee may find it useful to give a list of prohibited plants; these might be different in different parts of the country.)

WISLEY GARDENS.

Fellows are reminded that Wisley Gardens are now open on Sundays from 2 P.M. and this will continue every Sunday until the first Sunday in October.

On Wednesday and Thursday, April 6 and 7, there will be demonstrations at Wisley on the Spraying of Fruit Trees and on Shrub Pruning. Those intending to be present are asked to inform the Director beforehand, mentioning the day.

In April the Rock Garden and Alpine House are gradually reaching the peak of their beauty and are a great attraction to visitors. Some of the chief plants to be seen are the dwarf species of Narcissus, such as *N. nanus*, *N. Watieri*, and *N. triandrus* var. *pulchellus*; Anemones; Primulas; Saxifrages; Rhododendrons of the Lapponicum and Saluenense series, so suited to the rock garden; *Gentiana verna*; and in the bog the giant yellow Arum *Lysichitum americanum*, while the beds near the Alpine House are bright with varieties of Aubrietia and species of Tulipa.

In the Wild Garden many Camellias will be in full bloom, the old plants with dark red, rose, pale pink, and white double flowers, the younger and later additions giving new shades and types. The latter will be found in the clearing in the middle, where also are the several species of Corylopsis—shrubs with pale yellow pendent tassels, usually appearing before the leaves. Here too the ground is covered with the purple *Primula denticulata*, as illustrated in the February number of the JOURNAL. Some Rhododendrons will now be putting forth trusses of bloom, notably *R. Fargesii* and *R. Thomsonii*, in pink and blood-red respectively, with others fast approaching the period of flowering. *Shortia galacifolia* and *S. uniflora* are other shade-loving and ground-covering plants like the Primula, but evergreen with white or pale pink blossoms.

The principal feature of Wisley in April, however, is the Japanese Cherries in Seven Acres, beside the path leading to the Pinetum and the river. Of these *Prunus yedoensis* is one of the earliest to open, producing quantities of pale pink flowers, but the most showy is the fully double, rich pink 'Kanzan.' *P. subhirtella* and *P. incisa* are others of great garden value, which can be seen in the Award of Merit Garden nearby. Other shrubs and trees flowering in Seven Acres are the Japanese and Chinese Quinces (*Cydonia* species), early evergreen barberries, the sweet-scented *Osmanthus Delavayi*, the earlier varieties of Crab Apples (*Malus*), Exochordas and many others, whilst among them in the borders is the trial of Daffodils.

In the Heath Garden the several varieties of *Erica mediterranea* and particularly that called *superba* should be noted, as well as the taller (and more tender) *E. australis*, with its white, earlier-flowering variety 'Mr. Robert' from Portugal. *Cytisus* × *praecox* and *Genista falcata* are the forerunners in point of blooming of the large Broom family.



FIG. 29.—HELLEBORUS KOCHII.
(p. 157)

[*To face p.* 152.



Fig. 30.—Helleborus Kochii in Mr. G. P. Baker's Garden at Sevenoaks.

Other items in the Award of Merit Garden worthy of attention are the large specimen of *Magnolia Soulangeana, Berberis* × *stenophylla, Prunus subhirtella pendula, P. Avium plena* and *Malus* × *floribunda,* the last three forming an excellent trio for any garden sufficiently large to give them room. The Crocuses and Polyanthus beside the path from Seven Acres to the glasshouses are conspicuous on sunny days, and in the houses the visitor may see the Bird of Paradise flower (*Strelitzia Reginae*), Acacias, Begonias, Calceolarias, Schizanthus, tender Rhododendrons and a variety of decorative plants and shrubs.

MUTISIA DECURRENS.

By C. T. MUSGRAVE, V.M.H.

Two years after the introduction of *Mutisia decurrens* to this country from Chile, viz. in 1861, Sir W. J. HOOKER described it in the Botanical Magazine, vol. 87, tab. 5273, as " the handsomest species of the genus," though at the same time he went on to say : " It is to be feared that the fruticose plants of the high and dry Andes are difficult of cultivation and require a very peculiar treatment."

A little more than fifty years later, viz. in 1914, Mr. W. J. BEAN, in his great work, Trees and Shrubs Hardy in the British Isles (vol. 2, p. 88), bears out what was foreshadowed by Sir WILLIAM HOOKER when he writes : " Except in comparatively few places it [*Mutisia decurrens*] has not proved a success in this country and is now uncommon." At the same time, however, he describes one of the most striking successes of the cultivation of the plant which took place in the garden of Sir THOMAS ACLAND at Killerton, near Exeter. There, a plant put in and looked after for several years by Mr. J. COUTTS (subsequently Curator of the Royal Botanic Gardens at Kew) was grown on a wall facing south-west and carried at one time no fewer than 300 flower heads. The plant, he also tells us, produced suckers freely and ripened seed from which many plants were raised.

Similar successes may have occurred elsewhere, but no record is known of them.

Carrying the matter further and up to the present day, inquiries which have been made recently have produced answers which are all of a negative or non-committal character ; they show that the plant is not commonly met with in gardens, that it is not readily propagated, and that definite advice as to its cultivation is not forthcoming. There can be little doubt that the plant is still uncommon, but not, it is suggested, because there is any particular difficulty in its cultivation, but because, except when fertile seed is produced, it is not and never has been propagated in any but small numbers. In fact, it is an uncommon plant and not easily obtainable.

Mutisia decurrens can be and has been propagated in several ways. The first and simplest method is by seed, if and when good and ripened fertile seed can be obtained ; but such seed is not usually produced on plants grown out of doors in this country—in fact, the production of fertile seed is, so far as my experience goes, quite an uncommon occurrence. Seed has not infrequently been produced in my garden during the last twenty years when the weather conditions have been favourable, but none has ever germinated until this last autumn, when the fine dry hot weather of July and August enabled a strong

plant, carrying well over a hundred flowers, to produce a crop of seed from which a number of seedlings have been raised.

Another simple method of propagating this Mutisia is by taking up suckers from the root of the plant. These, however, are only produced on strong well-established plants, and not as a rule in any great numbers.

A third method of propagation is by striking cuttings. The process has been well described by the late Mr. L. B. STEWART in the Notes from the Royal Botanic Garden, Edinburgh, vol. viii, p. 137; but it must be remembered that he was a past master in the art of striking cuttings, and though his account reads as if it were a very simple matter, it is not altogether easy. The cuttings should be taken in July, August or September, and any pieces of the stem may strike, but the end of a stem and the short side-growths are the easiest. The art lies in taking the cuttings at the right time and in the right condition: if they are too soft they will damp off; if they are too hard they may strike eventually, but will take a long time about it. The cuttings should be inserted in damp sand and kept moist. In any event, whether plants are raised from suckers or cuttings, they are not raised in any great numbers, and in the absence of fertile seed this Mutisia must be classed as a scarce plant.

As to the cultivation of the plant there appears to be little if any information available. One or two points which experience has shown to be important can, however, be mentioned. Sharp drainage is absolutely essential for the plant, and any light porous soil will suit it. It is quite easy to kill it by planting it in a heavy soil, but apparently it has no objection to lime, as a plant does well in Major STERN'S garden at Highdown, near Worthing. A few flat stones placed on the ground round the base of the plant and over its roots seem, for some reason which is not altogether obvious, to increase the chances of suckers breaking up from the roots. Where a plant is grown on a wall it will be found that most of the suckers break up close to the wall. It is wiser to leave these to furnish the wall and to lift those only which break up some little distance from it.

The plant will not succeed in a dry spot any more than it will stand a very wet spot. The ideal position for it is on the south side of an evergreen tree or shrub, such as a Yew, or *Cupressus macrocarpa* or *C. Lawsoniana*, where it can scramble about as it pleases; but it will probably flower better on a wall, and there a west aspect is the best in the south of England.

As to the hardiness of the plant, there can be no doubt that it will withstand severe cold provided it has been given sharp drainage and light soil, but it is uncertainly hardy in the open in all parts of this country. It will be remembered that a plant of this Mutisia has been grown for many years on the rock garden at the Royal Botanic Garden at Edinburgh, but this must not be taken as an indication that the plant is hardy in all northern districts. Many plants flourish on that rock garden which will not stand in places much further south. In the

south and west of England it will probably be hardy in the open in any fairly sheltered position. Failing such a position, and in other parts of the country, it will be safer on a wall.

There is no direct evidence to support the suggestion that has been made that the plant is short-lived. It is true that plants which were known to be flourishing twenty and more years ago have passed away and no longer exist—even plants which were growing in gardens where they would have every attention; and this gives rise to a feeling of suspicion that the span of life of the plant may not be long. It seems more likely, however, that the plant, which is obviously by nature an underground traveller, uses up some constituent of the soil which it requires for its existence, and that it must be given a supply of fresh soil constantly if it is to be a permanency.

In my garden the top inch or so of soil round the plant is removed every spring and replaced by fresh soil consisting of a mixture of loam, sand and leaf-mould. When doing this care should be taken not to damage the roots of the plants, some of which may be very close to the top of the ground.

HELLEBORUS KOCHII.

By G. P. BAKER, V.M.H.

HELLEBORUS KOCHII (figs. 29, 30) was grown from seed sent home by my brother Arthur, collected by him when travelling in Armenia some years ago. On reaching the flowering stage and comparing my plants with those in the Herbarium of the British Museum it was determined they were no other than *H. Kochii*, so named and fully described by VICTOR SCHIFFNER in his Monographia Hellebororum (1890). Prior to this date this plant was generally known as *H. niger orientalis*, a name which did not satisfy SCHIFFNER, who made a very exhaustive study of material in the various herbaria in Europe; he furthermore made himself acquainted with the writings of many authorities and devoted some portion of a chapter to giving a critical review on each of the following writers on the genus: A. BRAUN, TOURNEFORT, GUNDELSHEIMER, HAYNE, GARSAULT, DESFONTAINES, LAMARCK, BOISSIER, BIEBERSTEIN, LEDEBOUR, TRATTINNICK and SPACH. He has some adverse remarks to make on each, pointing out how they had gone astray. Finally, with the very ample material placed at his disposal by the authorities under GUSTAV RADDE in the herbarium of the museum in Tiflis, he writes that by giving specific rank to this variety, in honour of KARL KOCH, who was the first explorer to have collected the material, he thereby made it possible to terminate for all time the utter confusion which had befallen the variety with its many synonyms.

The chief features of this Hellebore are its leather-like, firm perennial basal leaves, very large—in fact, *H. Kochii* has the largest of any species. The leaf stalks are 21 to 24 inches long, firm, at the base channelled and almost cylindrical, with seven to eleven leaflets; the whole forms a palmate spread of 16 to 19 inches diameter of a brilliant dark green. The outermost leaf is often so deeply divided that it can almost be considered as two leaflets united at the base; the next two arise from both midribs being bent and arched, and the following ones are close to the central leaflet and strictly speaking spring from the midrib. These basal leaves spread outwards with edges finely serrated with many small teeth. Another feature of the leaves is the very pronounced nervation, somewhat depressed on the surface, but on the underside of the leaf correspondingly elevated and more defined, the whole surface of a lighter green and covered with distant hairs. The flower stems are mostly or completely smooth, shorter than the petioles, with forked, cylindrical branches, flower stalks somewhat angular; flowers four or five on one stem, rarely more, large to very large up to $2\frac{3}{4}$ inches in diameter, rhomboid or

elliptic, nodding, cream in early stages turning to a brownish yellow-green as the sepals age. Bracts have five leaflets, the edges finely serrated for three-quarters to the whole of their length, and underneath more or less hirsute, as is the case with the branches and the flower stalks in variety *A* or smooth in variety *B*.

The nectaries are numerous, conical, narrowed to a short stalk; style green, tripartite, stigma small and white; carpels 3 to 6, flattened, distinctly keeled, free to their base, their edges do not touch, but bend slightly outwards.

There are two forms. Variety *A* has much larger leaves, which are strongly hirsute on the underside, and formed of a great number (up to 11) of very broad leaflets. Almost certainly synonyms of this variety are *H. orientalis* Koch and *H. ponticus* A. Br.

Variety *B* possesses distinctly smaller leaves with fewer, narrower segments, which, when developing, are smooth, as indeed is the whole plant. Only very young leaves may have just a little down. A synonym may here be *H. caucasicus* A. Br. et Koch.

Both varieties come into flower in November and last several months, and a characteristic of this species is that the strictly erect position of the flower remains so after fading. *H. Kochii*, with something like 22 to 24 flower stems, makes a handsome clump fully 4 feet in diameter.

It is a species readily distinguished from all other oriental species even by the colour of its flowers, but more particularly by the size of all parts, especially the leaves; for although *H. cyclophyllus* has very large leaves it cannot be mistaken because of the perennial leather-like leaves of *H. Kochii*.

Habitat. South-east shore of the Black Sea, and south from the Caucasus through Imeria, in the Caucasus in the mountainous regions of Ossnen and through Georgia, south to Russian Armenia; further east to Shirvan, Karabagh and West Talysch. Towards the west the species does not extend much beyond Trebizond.

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

LXXXIII.—DOWNY MILDEW ON ANTIRRHINUM.

By D. E. GREEN, M.Sc., Mycologist, Wisley.

FOR many years in this country Antirrhinums, although they were known occasionally to be attacked by several minor fungus parasites, did not often suffer serious damage.

Since the serious attacks of rust upon them, closer observation has been kept and a disease, not previously recorded in England, has been found, at present, fortunately (as far as is known), not widespread. The first warning of its presence came from Ireland in May 1936, when the Plant Pathological Laboratory of the Ministry of Agriculture received from co. Carlow some seedlings which were attacked by a fungus of the downy mildew type, believed to be *Peronospora Antirrhini* Schroet. In view of the possible spread of this disease, drastic measures were taken and all Antirrhinum plants (about 50,000) on the nursery concerned were destroyed. This outbreak has since been described by MURPHY,* who gives an opinion that the disease may be controlled in the seedling stage.

The Ministry of Agriculture in their Monthly Bulletin on Plant Pests and Diseases for May 1936 drew the attention of their advisory officers to the outbreak and asked them to keep a lookout for any sign of the disease in Great Britain.

No further report was received until June 1937 when young Antirrhinum plants sent from Sussex to the Society's Laboratory at Wisley were found to be suffering from attack by a downy mildew similar to the one reported from Ireland in 1936. The case was reported and specimens sent to the Ministry of Agriculture's Laboratory from which confirmation of the disease was soon received. A note describing the symptoms was therefore published † to warn growers of the existence of the disease and asking that any suspected plants should be sent for examination so that information could be obtained as to its distribution. Although different samples of plants exhibiting peculiar symptoms were received at the Wisley Laboratory last season none from any other locality has shown attack by this downy mildew.

The appearance of this disease in England raised the question of its destructive capacity which, from the appearance of the plants and the information supplied by the sender, seemed likely to be great.

* MURPHY, P. A. Irish Free State: a new outbreak of *Peronospora Antirrhini* in the country. Int. Bull. Pl. Prot., xi, 8 (1937), p. 176.

† GREEN, D. E. "Downy Mildew on *Antirrhinum majus*." Gard. Chron., cii (1937), p. 27.

The Ministry of Agriculture decided that steps should be taken to eradicate this disease if possible while the attack was still confined to the one locality. Accordingly, on June 24, a member of the Ministry's Plant Pathological staff and the writer visited the locality concerned. In this area Antirrhinum plants affected with the downy mildew were found in three places, but all had originated from the same nursery in which there still remained some 8,000 plants in boxes. These 8,000 plants were being crippled by the disease, despite attempts to check the trouble with Liver of Sulphur. On request all these plants were destroyed.

Symptoms of the Disease.—Owing to the destruction of all affected Antirrhinums it is only possible to describe the symptoms of the disease as seen on young plants still in the boxes or only just planted out.

The most obvious effect of the attack of this downy mildew is the dwarfing caused by the check to the young shoot growth. The shortening of the internodes produces a rather bunched or rosette appearance in the top of the plant (fig. 32). There is also reduction in size of the youngest leaves and a tendency for their tips to curl under. Some of the leaves may also become twisted. The downward curling of young leaves or even young shoots cannot be taken as a symptom of this disease alone, for similar curling is often associated with other troubles, *e.g.* early attack by aphis. There is frequently a good deal of so-called " curl " in Antirrhinum plants, the cause of which has not yet been determined.

The rather crowded and bunched look at the top of a plant is partly a result of the retardation of growth in the central shoot, and this is the usual appearance ; but there were a good many boxes of seedlings in which the lower leaves were severely infected but which possessed a fairly long central spike with very small incurled leaves. This difference was probably not due to different varieties but to later infection which occurred on the lower leaves after the central spike had already elongated to some extent.

The clearest evidence of the disease is the appearance on the under-surfaces of the leaves of mealy-white patches, which may cover almost the whole. These white, furry-looking patches are quite easily seen with the naked eye (fig. 32), but it is more satisfactory to examine them with a hand lens. They are composed of the spore-bearing threads of the fungus (conidiophores) which release the spores (conidia) for spreading the disease. Some of the small and curled upper leaves may bear these white patches, but they have been found mostly on the undersides of the larger basal leaves of the affected plants. Seen from the upper surface an affected leaf generally shows a light green patchy discoloration. In all probability the small size of many of the upper leaves is due not so much to direct attack on them by the fungus as to a retarding effect on the whole plant due to the fungus attack on the older and larger leaves. Support of this view seems to be given by the production of young secondary shoots at the bases of infected plants (fig. 32). There was no suggestion that the plants

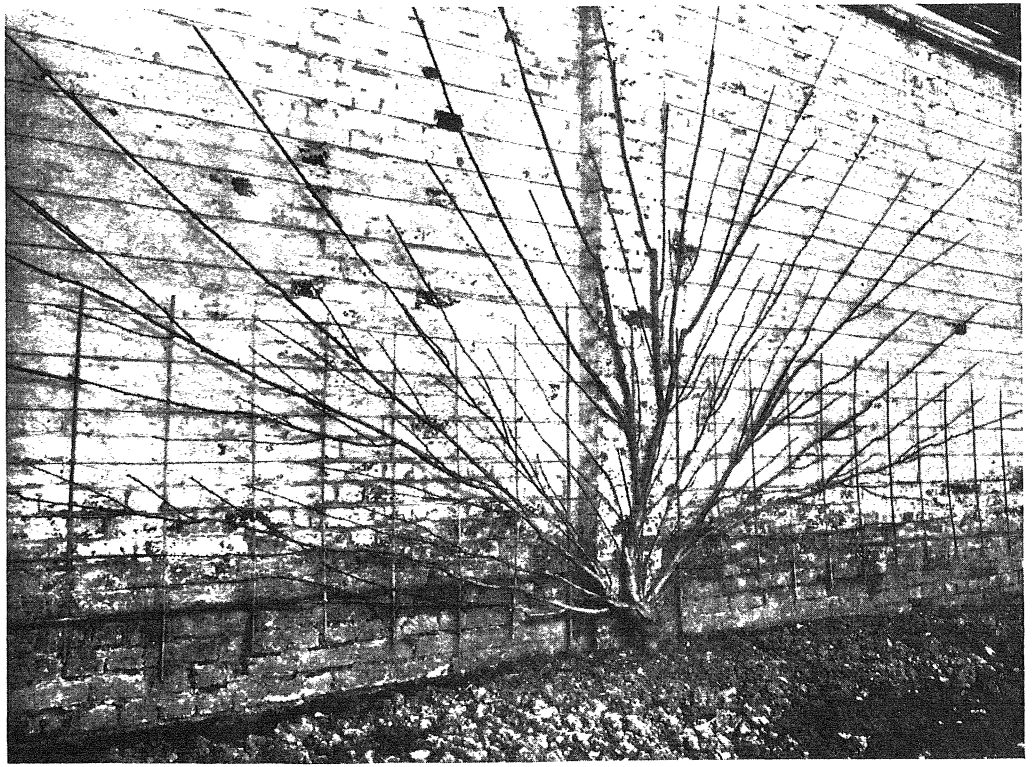


FIG. 31.—FAN-TRAINED PEACH AT BARHAM COURT, MAIDSTONE.
(p. 170)

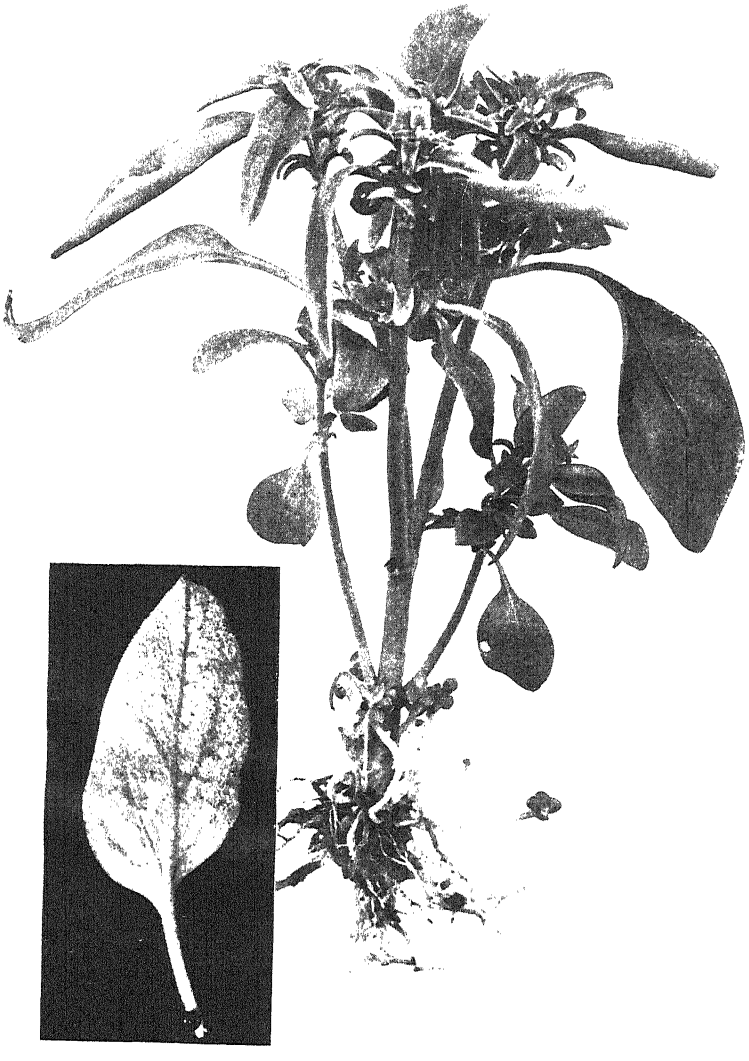


FIG. 32.—ANTIRRHINUM ATTACKED BY DOWNY MILDEW.
Showing the bunched growth which results, and on the left the lower surface of a leaf covered with the mildew.

[*To face p.* 161.

had been predisposed to attack through weakness, for the root systems of the affected ones were very healthy and vigorous.

The Parasite.—The disease is caused by a species of fungus belonging to the genus Peronospora, the members of which family cause diseases of the type known as Downy Mildews. The one that is here described on *Antirrhinum majus* is thought to be that named *Peronospora Antirrhini* by SCHROETER.*

The fungal threads (hyphae) which ramify through the cells of the leaf are rather swollen and without cross-walls. On an infected leaf in due course the hyphae send up aerial threads which protrude through the stomata. These threads become the spore-bearing structures (conidiophores) of the fungus and they are formed in such large

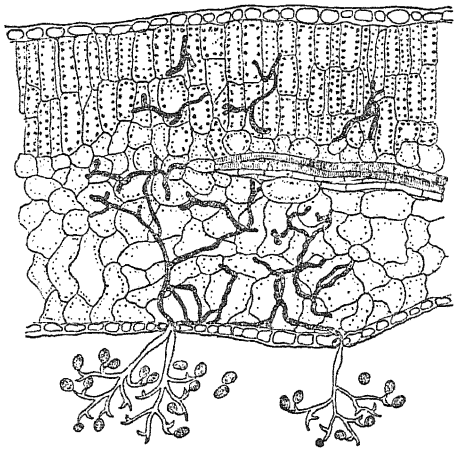


FIG. 33.—SECTION OF LEAF OF ANTIRRHINUM SHOWING FUNGUS THREADS AND FRUITING BRANCHES.

numbers as to produce the mealy white appearance on the underside of the leaf (fig. 32).

Fig. 33 shows a semi-diagrammatic drawing of a cross-section through an affected leaf in which the fungal threads are seen growing in the leaf cells and three conidiophores have reached the air by way of the stomata in the lower epidermis. The conidiophores are several times branched and bear spores (conidia) at the ends on two short, pointed, ultimate branchlets which are bent almost at right angles to each other (fig. 34). The conidia are egg-shaped, and when fully grown were found to measure 22 to 24 μ long by 15 to 16 μ broad.

Amongst parasitic fungi the members of the genus Peronospora usually form thick-walled resting spores (oospores) in the host tissues. These spores are able to withstand unfavourable conditions and so survive the winter to germinate another season and carry on the disease. In many downy mildew diseases oospores are

* SCHROETER, J. Ueber *Peronospora violacea* Berkeley und einige verwandte Arten. Hedwigia, 13 (1874), p. 183.

formed quickly and in tremendous numbers, and the soil becomes infected by the falling of diseased leaves and other tissues. In the

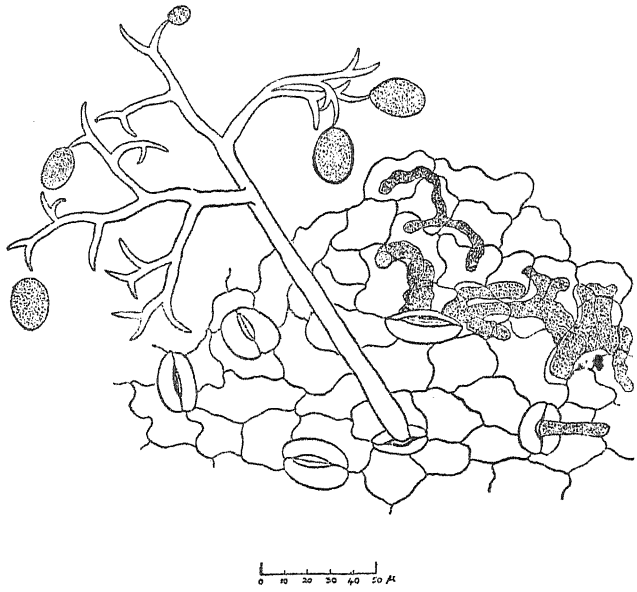


FIG. 34.—FRUITING SHOOT OF PERONOSPORA ANTIRRHINI WITH SPORES (CONIDIA).

fungus under examination the formation of oospores seems to be long delayed and in any case not common. Many of the diseased leaves of *Antirrhinum majus* concerned in the present case were subjected to

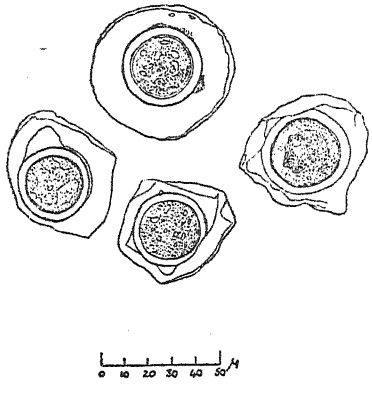


FIG. 35.—RESTING SPORES OF PERONOSPORA ANTIRRHINI.

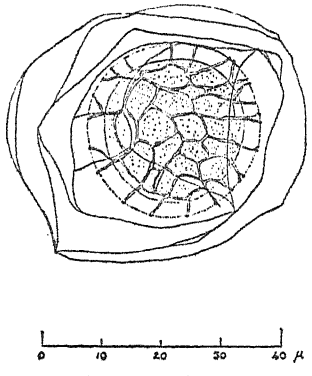


FIG. 36.—RESTING SPORE OF PERONOSPORA ANTIRRHINI SHOWING MARKINGS ON WALL.

a long and careful examination but very few oospores have been seen. Only in leaves kept in a moist dish until they were completely brown and dead were oospores found and these were few in number.

These oospores were spherical with light brown walls and measured from 30 μ to 38 μ in diameter when mature (fig. 35). The wall showed evidence of slight wrinkling and remains of the old oogonial envelope could be seen persisting around the oospore for some time (fig. 36).

This parasite has been accepted tentatively as *P. Antirrhini* Schroet.

There appears to be no detailed description of a *Peronospora* sp. attacking the cultivated varieties of *Antirrhinum majus*, but a search of the literature reveals certain observations that undoubtedly refer to this disease.

The fungus named *P. Antirrhini* has been often recorded as occurring on *A. Orontium*, and it was on this plant that it was first named and described by SCHROETER * in 1874. In 1913 it was noted by J. LIND † in the herbarium of E. ROSTRUP, Copenhagen, on *A. Orontium*, and in 1923 by GÄUMANN ‡ as occurring on *A. Orontium* in Switzerland, Germany and Denmark. GÄUMANN in his monograph on the genus Peronospora held the view that the forms occurring on the family Scrophulariaceae ought to be split up into a larger number of species and he described no fewer than eighteen species. STEVENSON § in the U.S.A. in 1926, writing on foreign plant diseases, under the heading "Antirrhinum," gives *P. Antirrhini* Schroet. as causing downy mildew on the leaves of *A. majus* and *A. Orontium* in Denmark, Switzerland and Germany. This may be an extract from GÄUMANN'S monograph published three years previously, but if so the inclusion of *A. majus* must be an error.

In 1931 FLACHS ‖ includes Antirrhinum as though speaking of the cultivated plants and says "Undersurface of leaves with dense violet fungus mats—Downy Mildew—cause, the fungus *Peronospora Antirrhini* Schroet." He adds a brief description of the fungus. PAPE,¶ however, in a later book does not mention the disease.

From this it seems that there is no reliable record of the fungus attacking *A. majus* before that of FLACHS in Germany in 1931, and although he does not mention *A. majus* specifically, the probability is that he was speaking of cultivated Antirrhinums.

SCHROETER reported *P. Antirrhini* as a new species distinct from *P. Linariae* Fuckel, after he had compared *P. Linariae* on *Linaria vulgaris*, *L. minor*, and *L. arvensis* with his Peronospora on *Antirrhinum Orontium*. He saw no oospores in the attacked Linarias, so was not able to make a comparison in this respect, but he examined the oospores of *P. grisea* Unger (which DE BARY regarded as identical

* SCHROETER, J., *l.c. ante.*

† LIND, J. Danish fungi as represented in the Herbarium of E. Rostrup. Copenhagen (1913), p. 68.

‡ GÄUMANN, E. Monographie der Gattung Peronospora, Corda. Zurich (1923), p. 142.

§ STEVENSON, J. A. Foreign Plant Diseases. U.S. Dept. Agric. Wash. (1926), p. 16.

‖ FLACHS, K. Krankheiten und Parasiten der Zierpflanzen. Stuttgart (1931), p. 42.

¶ PAPE, H. Krankheiten v. Schad. Zierpflanzen. 2nd ed. (1936).

with *P. Linariae*) and he stated these to be very different from those of *P. Antirrhini*.

SCHROETER'S description of his *P. Antirrhini* on *A. Orontium* does not agree in some respects with the fungus seen in the tissues of Antirrhinum plants here concerned. The conidiophores of *P. Antirrhini*, according to SCHROETER'S description, cover the undersurface of the leaves with thick violet mats, but those seen on the leaves of Antirrhinum in this case were mealy white to yellowish brown. The conidial measurements agree very closely with those given by SCHROETER for *P. Antirrhini*. SCHROETER describes the oospores as follows: "Oospores in a light brown irregularly wrinkled epispore with which they measure 28–32 μ and without about 24 μ in diameter." The oospores seen by the writer in leaves of *A. majus*, attacked by this downy mildew, have light brownish yellow walls, showing faint wrinkling of the epispore but their diameter is greater, being 30–38 μ. Tests of cross-inoculations, etc., cannot be made because the present policy must be to destroy affected plants with a view to eradicating the disease, but in the opinion of the writer this downy mildew of cultivated Antirrhinums cannot yet be ascribed with certainty to *P. Antirrhini* Schroet. Until a comparison of different species is made the identity of this Peronospora on *A. majus* must remain doubtful.

Control.—It will be appreciated that, owing to the attempts to eradicate the disease by destruction of all affected plants in the one locality where it has occurred, it has not been possible to carry out any experiment on the control of this downy mildew. Nor, in the observations made regarding this disease on the Continent, is there the slightest mention of remedial measures.

In the present outbreak, however, some attempts were made to combat the trouble by watering with Liver of Sulphur, 3 ounces dissolved in 8 gallons of water. This was done at the first signs of infection, when the young plants were about ten or eleven weeks old. For two or three weeks it was thought that the trouble had been checked, but after one month it was apparent that the disease was persisting and, as already stated, some 8,000 plants still in boxes had to be burnt. Later many more plants in the beds were found to be attacked and these were also destroyed. Altogether about 20,000 plants, suspected as infected in this area, were destroyed last season. This unsuccessful treatment with Liver of Sulphur seems to be the only record we possess about attempts to control the disease.

Downy mildews are encouraged by humid conditions existing around the foliage and it is obvious that in this country such conditions can exist not only among the seedlings in boxes, but also among plants growing very close together in the beds. It is advisable that plants in boxes while still in frames should not be kept in very moist conditions, but that ventilation should be adequate enough to avoid excessive humidity. The fungus is probably able to attack Antirrhinum seedlings at any time, but the known attacks have occurred in April and May.

It is hoped that growers will keep a sharp lookout for the symptoms which indicate the presence of this disease and obtain expert information on any suspected plants as speedily as possible. Where the disease is identified the affected plants should be burnt and the soil in which they were growing treated with 2 per cent. Formalin solution or otherwise sterilized. The remaining unaffected plants should then be protected by spraying with home-made Bordeaux mixture or dusting with a copper-containing dust, taking special care to treat the undersurfaces of the leaves.

In conclusion the author wishes to express his thanks to Mr. W. A. MOORE, M.A., of the Ministry of Agriculture's Plant Pathological Laboratory, for his interest and assistance, especially in supplying references to literature.

THE INFLUENCE OF ONE PLANT ON ANOTHER.

By Professor F. E. WEISS, D.Sc., F.L.S., F.R.S.

THE influence exerted by one plant upon another has often been discussed in connexion with the horticultural practice of grafting. Some botanists, like Professor L. DANIELS of Rennes, have asserted that the scion is often considerably modified by the stock on which it has been grafted, but there is a general consensus of opinion that any direct modification of the stock is negligible or non-existent. Indeed the *raison d'être* of the practice of grafting would disappear if there were any serious change in a choice variety of fruit caused by the underlying wild stock. That the stock may exert some controlling effect is undoubted, for a less vigorous root system, as, for instance, that of a quince, will cause a decrease in the vegetative vigour of the ingrafted pear and thus lead to earlier fruiting. The choice of the stock in the grafting of fruit trees and other plants which are usually propagated by grafting is therefore very important, and is receiving more and more attention in the fruit research stations.

An exception to this general rule of the non-transmission of characters from stock to scion must be made in the case of the infectious variegation of the foliage, especially in the case of many members of the Malvaceae.

Ever since the early observations of FAIRCHILD in grafting a variegated form of Jasmine on a pure green stock, and of LEMOINE, who grafted the variegated *Abutilon Thompsonii* on the normal green *Abutilon megapotamicum*, this phenomenon has attracted the attention of horticulturists and botanists. Professor BAUR, in an exhaustive treatise of this problem, has shown that it is of considerable frequency, and has proved its occurrence, apart from the Malvaceae and Jasmine, in Fraxinus, Laburnum, Sorbus, Euonymus, and the Privet (Ligustrum). The actual cause of this infection has not yet been elucidated, but it is probable that it is of the nature of a virus disease similar to that which produces the mosaic disease of the Tobacco, and the various crippling deformations of the Potato and other plants now being investigated in the Plant Virus Station at Cambridge.

While we cannot at present assert that the various viruses are definite organisms, bacteria and other fungal parasites do produce considerable modifications in the plants which they attack. The witches' brooms which can be observed in the crowns of birches and cherries are perhaps the best known modifications of the branch system produced by the fungus Exoascus, and numerous examples of the malformation of leaves by fungal attack will suggest themselves to any observer of plants.

Being underground, the root tubercles of the leguminous plants are less easily observed, but here too the entrance of *Bacillus radicicola* through the root hairs causes the tissues of the root to multiply rapidly and produces the characteristic swellings, inhabited by the actively multiplying bacteria. These do not, however, only produce this recognizable change in the tissues of the host, but also, as is well known, contribute to its nutrition by their power of fixing free nitrogen found in the interstices of the soil and transforming it into nutritive nitrates which they pass on to the fortunate host plant.

A similar influence is exerted by more highly organized fungi which enter the root hairs of Orchid seedlings and cause the formation of the characteristic swollen base of these plants. And this physical change is associated with a physiological effect, for it has been shown by BERNARD and BURGEFF that the successful germination of many of our greenhouse Orchids depends upon the presence of such a fungus. The presence of fungi in the roots of many of our forest trees, and indeed in a very large number of plants, seems to be equally beneficial, probably owing to the faculty the fungus possesses of absorbing organic nutritive materials, which the ordinary green plant cannot take in itself. This living together of two such dissimilar plants is spoken of as symbiosis. The presence of the fungus in the roots of a higher plant—mycorrhiza, as it has been called—frequently causes a change in the appearance of the root system, which branches very freely, often forming coral-like masses.

Of recent years considerable discussion has taken place among botanists as to the existence or not of certain rays emanating from living organisms, and said to exert an influence on the growth of other organisms. GURWITSCH called these "mitogenetic" rays, because his experiments showed that they stimulated cell division in the plants upon which they acted. These problematical rays are said to have a short wave-length and to belong to the ultra-violet group of rays. In addition to the onion roots in which they were first observed, they are said to be produced by bacteria, yeast cells, potatos, as well as by a number of small animal organisms and animal tissues. Various investigators, however, who have repeated GURWITSCH'S experiments have failed to obtain his results, and the existence of these problematical rays has not been generally confirmed.

But though we may be sceptical about the existence of these mitogenetic rays, there is no doubt that the roots of many, if not of most, plants give off toxic substances which act in a deleterious manner on other vegetation. By a series of careful experiments carried on during many years on the Woburn Experimental Fruit Farm, SPENCER PICKERING has shown the harmful effect exerted by grass growing on the soil in which fruit trees have been planted. The amount of growth of the latter, their fruiting capacity and general health are greatly impaired when grass is allowed to grow around them as compared with trees in a tilled soil. The experiments showed that this effect is not due to exhaustion of moisture or nutritive material

by the cover of grass, but that the latter or other plants with which PICKERING experimented excrete some harmful toxic substances the nature of which has not yet been ascertained.

More recently experiments carried out for the Food Investigation Board have shown that toxic substances are given off by ripening fruits which inhibit or retard the growth of plants. It has been shown by KIDD and WEST in this country, and by HANSEN and HARTMAN in America, that apples, pears, bananas and other fruits give off during the respiratory process connected with their after-ripening a certain amount of ethylene vapour which has the effect of accelerating the ripening process. JANSON describes in an Austrian horticultural journal the result of storing early- and late-maturing apples in close proximity. He found that the after-ripening of the latter was considerably accelerated by the presence of the early apples.

But fruits do not only exert an effect on other fruits. ELMER showed in 1932 that the sprouting of potatos was inhibited by the volatile products of apples, and in the following year HUELIN proved that ethylene had the same effect. Later GANE and SMITH observed that the growth of pea seedlings was affected deleteriously by an active substance produced by ripe apples, and that a similar result was obtained with ethylene vapour. There seems no doubt therefore that this is the toxic substance; which is confirmed by the fact that both ethylene and the vapour from apples produce peculiar bending (epinasty) of the leaves of seedlings grown in proximity to apples.

Most of these facts concerning the vapours given off by ripening fruits are the outcome of researches undertaken for the Food Investigation Board, but quite recently (1937) the late Professor MOLISCH published the results * of some further experiments he had carried out in elucidation of these curious phenomena. He used the seeds of peas and vetches, germinating them in closed bell-jars in one of which he placed three small ripe apples. The result was that in the presence of the apples the growth of the seedlings was either inhibited or very considerably reduced. The same effect was obtained if oranges, lemons or bananas were used in the place of apples. A further interesting experiment was made by exposing the seedlings for only a short period to the effect of the apple vapour. When kept for only 1 or 5 hours in proximity to the apples the growth of the seedlings was actually accelerated, showing that the vapour of the apple behaved like some other organic poisons, morphine for example, which act as stimulants in small doses.

As it is known that the roots of plants excrete substances which help to dissolve the mineral constituents of the soil, MOLISCH investigated the roots of certain plants with a view to ascertaining whether they exerted any influence on neighbouring plants. He found that the roots of horseradish and carrot actually stimulated the rate of growth of the seedlings, but if the roots were cut longitudinally into

* MOLISCH, Professor H. Der Einfluss einer Pflanze auf die andere, Allelopathie. (Fischer. Jena.)

four pieces the rate of growth was retarded. Evidently in the case of the undivided root the emanation was only slight and would thus act as a stimulant and not as a poison, while the divided root, giving off more vapour, inhibited the growth of the seedlings.

Some very interesting results were obtained with the balls of roots of *Melaleuca squamea* and *Acacia verticillata* when turned out of pots in which they had become more or less pot-bound. MOLISCH had noticed that they had a disagreeable odour, and on placing them under a bell-jar with seedlings of the vetch, found that they accelerated the growth of the same.

Experimenting with many other vegetable structures, such as potato tubers, onions, mushrooms, vegetative and flowering shoots of plants, MOLISCH found that in most cases they affected the growth of seedlings. Usually they had a retarding effect, though not so marked as that of apples. The effect of two inflorescences of the Lilac, however, proved very deleterious to tomato seedlings, causing the cotyledons to bend downward, to lose their green colour and to fall, as well as inhibiting the growth of the stem.

The fall of leaves is indeed a very marked phenomenon when shoots of woody plants are exposed to the emanations from apples. This was proved in the case of Privet, Elder, the sensitive plant *Mimosa pudica*, *Caragana arborescens*, *Euphorbia splendens*, and *Parthenocissus tricuspidata*.

Another curious effect of apples was that they promoted the growth of callus in cuttings of the Poplar and Willow, and stimulated root formation in the latter, thus acting very like some of the growth-promoting substances or plant hormones, such as hetero-auxin, which have recently been investigated. These growth-promoting substances also agree with the emanation from apples in causing curious bending movement of the leaves and often irregular growth of stem and roots. They also share with them a retarding effect on the opening of buds.

What is the importance of these emanations to the fruits themselves? That is still an open question. There is no doubt that the ethylene is concerned in the first place with the maturing of the fruit. But as it has also been shown by experiment to inhibit the growth of the fungus Phycomyces, it may be of some use in preventing premature decay of the fruit. In addition it may act as an inhibitor of premature germination. That the seeds of most plants which possess succulent fruits are provided with some substance inhibiting early germination has been shown by OPENHEIMER and FLEURION, and it is possible that the ethylene emanation from fruits is useful in a similar capacity.

THE HISTORY AND CULTIVATION OF THE PEACH AND NECTARINE.—II.

(*Cont. from p.* 121.)

By EDWARD A. BUNYARD, F.L.S.

[Read October 12, 1937; Mr. C. G. A. NIX, V.M.H., in the Chair.]

THE Peach * is hardy in our English climate, and though in America buds are sometimes frozen in winter, I should imagine this is rare in this country.

The practice of growing Peaches on walls arises not so much from the difficulty of ripening fruit in the open as from the need for some protection for the flowers. Where the Peach grows happily, in South Africa, California, or in Provence, when the winter is over it is done with: there is no lingering in the lap of spring. With us it is usually the reverse, and so we are obliged to protect in some way the early-flowering Peach, and a wall is a convenient way.

The Border.—Good drainage is indispensable, and the first thing is to ensure that no water can lie about the roots.

An old plan which might well be revived was the provision of a bed of chalk 3 feet down; this, while allowing water to percolate, stops the roots from penetrating into the subsoil, and as Peaches are grafted on Plum stocks they thrive on this chalky subsoil.

A layer of chalk 6 inches deep, well beaten down, will be enough, and is better than the concrete slabs which are supposed to keep roots from going down too deeply.

The border should, if possible, be made up of good loam, and we cannot do better than copy Mr. OWEN THOMAS's instructions from The Fruit Garden for its preparation and composition.†

"Begin by digging out all the soil inside the house to the depth of 2 feet 9 inches, and similarly treat the outside border; each border should be 9 feet wide, measuring from the front wall of the house. Any clayey soil, or that which is poor, must be removed, but any of good quality may be retained, and can be used again when mixed with new soil in the formation of the border. Assuming that the soil has been cleared away to the depth mentioned, the next question to consider is that of drainage; first, lay the main drain . . . at the base of the border. It should empty itself at some convenient point of lower level. If the subsoil should prove to consist of stiff clay or marl, it will be necessary to concrete the bottom to prevent the roots from penetrating this undesirable medium. The border must then be

* Where the Peach is named in the remarks upon cultivation it is to be understood that this applies also to Nectarines.

† BUNYARD, G., and THOMAS, O. The Fruit Garden (1904), pp. 95, 96.

3 feet deep. If, on the contrary, the substratum should be of sandstone or chalk, no concrete is necessary; if it is found to consist of a good bed of gravel or sand no other drainage will be necessary, neither would the main drain spoken of be required. Artificial drainage, however, must be provided in most cases, and the best way to secure this (after the main drain has been laid down) is by laying 4-inch pipes at the bottom of the border, 4 feet apart, obliquely towards the lower end of the main drain and emptying into it. The bottom of the border should be so formed that there is a fall of at least 6 inches towards the main drain. The pipes should be covered with a layer of broken bricks, stones, or such rough material as is at hand, and will carry water away rapidly. I have no hesitation in condemning the making of rich borders for the planting of young fruit trees of any kind. . . . The border I recommend should be first made 5 feet wide—3 feet wide inside, and 2 feet outside; the front wall must be arched to allow of the roots spreading both inside and out. In commencing to form the border place turves grass-side downwards over the drainage, and build turf walls at the limits of the 5-feet wide border; they should be parallel to the wall of the house and 2½ feet high.

"The border should be formed of fairly heavy loam cut from old pasture land. This should be stacked long enough to destroy the grass roots and no longer; a couple of months will suffice. When preparing the turf for the border it should be chopped into pieces about 5 inches square, and to each cartload of loam add a barrow-load of road scrapings, and the same quantity of old mortar rubble, broken bricks, and a bag of ¼-inch bones. I may here draw attention to . . . the necessity of the soil in which they are grown having a liberal mixture of lime in its composition. The compost should be turned over several times, and when well mixed place loosely in the border between the two turf walls. The soil must not be prepared when wet, nor should it be very dry; it must be moistened if necessary to make it friable."

If we cannot arrange for a complete new border, we may ameliorate the existing soil by lightening heavy clays and strengthening light sands with some rotted turf, and adding to all lime in some form. Chalk in small nuts is good.

Aeration is of the first importance, and therefore the addition of broken bricks or coarse sand to heavy soils should be made.

The border should be made some months before planting to allow the soil to settle down. A very open soil causes a too vigorous growth in Peaches, and THOMAS RIVERS advised that the border should be beaten hard with a mallet every year, the top 6 inches only being kept light as a dust mulch.

This is, of course, what we do for Peaches and other fruit trees in pots, and the growth of all fruit trees can be greatly checked by keeping the soil very firm.

Aspect.—In most parts of this country, Peaches require a warm aspect, and so south and south-west walls are advised.

Where summers are hotter, in France for instance, east walls are often chosen, as they might also be in the warmer parts of this country, and this would enable growers to extend the season of any favourite variety.

Planting.—Young trees in the nursery retain their leaves very late in the southern counties, and so if we wait until all the leaf has fallen, this would usually bring us into December.

If the wood is well ripened, no harm will be done by stripping the leaves in October, and planting the trees when the soil has not yet lost its summer heat.

In the south, trees are planted at any time in winter when the weather is open. Planting depth is important, and as Peaches are budded some 6 or 9 inches above the soil level, this junction of bud and stock must be kept at the same height when the tree is re-planted.

Allow the tree plenty of time to sink—as it will if the soil is light—before tying it to the wall.

Pruning after Planting.—Except where large fruiting trees are planted, the first object is to get some good shoots to form the main branches of the tree.

Young trees are often permanently stunted by allowing them to fruit the first year, when they will not have vigour enough to make replacing shoots as well as fruit.

Prune the main branches back to one-third of their length to a good wood bud pointing in the desired direction.

An old plan, which has much to commend it, was not to prune but to bend the branches in a downward curve. Strong shoots then break from the buds at the top of the curve, and when they have made 18 inches of growth, the best are selected and laid in, and the ends of the old branches are pruned off in June or July. As the tips of the branches will probably have some anticipated shoots, nothing is lost in cutting these away.

Shading the Stem.—No tree naturally grows in our climate with a clean unshaded stem, and much damage is often done by sun scald on such stems on hot walls.

If a standard, shade with straw or sacking; if a dwarf, a piece of board stood in front of the stem and covering the bud union will be of great assistance.

Watering.—In full growth a Peach requires much water, and as a brick wall is a great robber of water, and also of soil chemicals, heavy watering should be given on dry soils in June and July.

The practice, all too common, of making herbaceous borders on the Peach border is fatal to success, and it is impossible to grow good fruit and good flowers on the same border.

Syringing.—Overhead syringing in the summer months is of great assistance in maintaining good foliage, and thus good fruit, and is especially needful for keeping down the red spider, one of the Peach's

most constant pests. No injury results if it is done when a hot sun is shining.

Pollination.—So far as is known, all Peaches and Nectarines are self-fertile, and so any variety will fruit when grown alone.

It is usual under glass to pollinate with a rabbit's tail, but out of doors there are generally bees and flies at work when the flowers open.

Thinning.—A frequent cause of bad quality in all fruit is the lack of careful thinning, and Peaches suffer especially in this way.

Peaches and Nectarines being self-pollinating, the greater part of the flowers set fruit, barring accidents such as frost. It is therefore important to begin thinning as early as possible to save the tree the waste of good material which goes to the making of stone and kernel.

Thin " when the size of a hazel nut," say most authorities, and it should be a small one at that. Two fruits to each fruiting shoot can be left at the first thinning to make allowance for mischance, but when stoning is done one only should remain.

A vigorous tree can carry more fruit than a weakly one, but the final crop should be so spread that each fruit is 1 foot apart from the nearest.

Any overcropping is mortgaging next year's crop, and an overspending that has to be paid for later on.

As the fruit swells, remove any leaves which shade it and bring fruits to the best position for light, even if this means untying and replacing a fruiting shoot.

Protection in Flowering Time.—Peach blossoms are fairly hardy, but sometimes are caught by frosts in April or May, and on walls it is found that a piece of fish net is sufficient to protect the flowers. This should be drawn away during a sunny day to allow insects to visit them.

Pruning.—The pruning of Peaches and Nectarines is one of the most complex operations that confront the gardener, and many lengthy volumes have been devoted to it. In the space at our disposal it is not possible to treat this subject in full detail; we must therefore content ourselves with an outline of the main points.

Owing to the special character of the Peach in making its fruit buds in one year on the growths made in that year, and the fact that this fruiting wood does not fruit again, the pruning adopted for Apples and Pears is not practicable.

The fruiting shoots also do not make new growth except at the tips, so, if they are allowed to grow unpruned, the lower branches become bare, and we have a tree, as too often seen, with fruit only at the extremities of the branches.

Our aim, therefore, is the replacement of fruiting shoots by new ones from the base of that shoot, and pruning is directed to this end. So important is this that we must even sacrifice fruit for one year, if necessary, so as to get a fresh growth.

The experienced pruner is thus always looking a year ahead.

The Peach, like the Pear and Apple, makes various kinds of shoots and even spurs, and they may be described as follows :

The *growth shoot*, which has wood buds only, is like that of the Apple or Pear, known as *bourgeon* in France, and the first growth of a one-year budded plant, or " maiden," is of this character. No flower buds are produced upon this shoot, but only from further growths which will next year proceed from its buds. Where, however, growth is very vigorous, some of these buds, usually at the top, will start into growth during the same year that the shoot is produced. These buds, as it were, anticipate the next year's normal growth, and

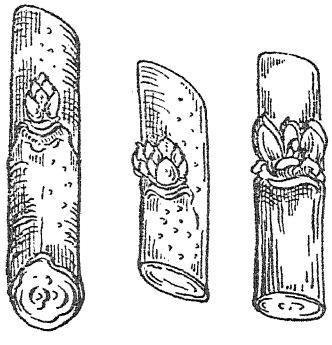


FIG. 37. — PEACH BUDS; A SINGLE BUD, A DOUBLE BUD, AND A TREBLE BUD WITH TWO FLOWER BUDS AND ONE GROWTH BUD.

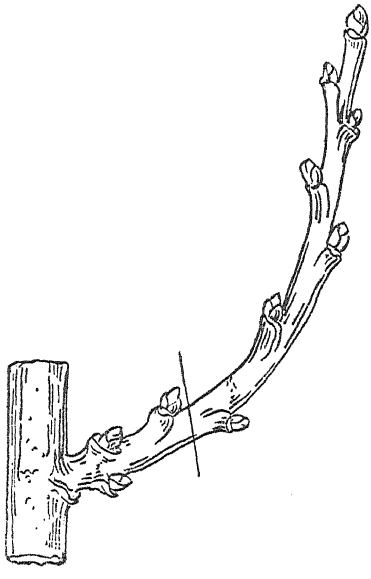


FIG. 38.—SHOOT WITH WOOD BUDS ONLY.

are known in France as *bourgeons anticipées*. We will adopt this name and call them anticipated shoots.

They are undesirable productions, but can be brought into fruiting by careful summer pinching ; but as they are almost always produced at the top of a strong shoot which is intended to form or continue a main branch, it is generally best to prune the portion of the shoot away which bears them and get a fresh growth from a wood bud below them.

The second growth, and the most important, is the flowering shoot which has flower and growth buds combined (see fig. 37).

This is the main fruit producer, and it is to the maintenance of a sufficiency of these that the pruner's aim is directed.

These fruiting shoots result from a balanced growth, neither too weak nor too vigorous ; and, as in the Apple or Pear, over-vigour means a production of flowerless shoots.

These flower shoots are very like the *brindilles* of the Pear, about $\frac{3}{16}$ inch in thickness and quite flexible.

When the tree is weak and starved, these shoots may be only of the size of knitting needles, and though they may bear an occasional flower bud they are not strong enough to develop good fruit, and certainly not able to make fresh replacement shoots. A predominance of such thin shoots is evidence that the tree is starved for water or manure.

The next production is the spur, or *bouquet de mai* as known in France. This is almost exactly like the spur of the Pear, a cluster of flower buds on a short stem 1 to 2 inches long, but it has usually a central growth bud which enables it to elongate.

A large number of such spurs indicates lack of vigour, and if a tree is frequently removed, most of the fruit will be mainly produced from them.

It might seem an easy way to dodge the complexities of pruning, by frequent root pruning; but it can be regarded only as a temporary method—if so treated the tree will gradually lose vigour.

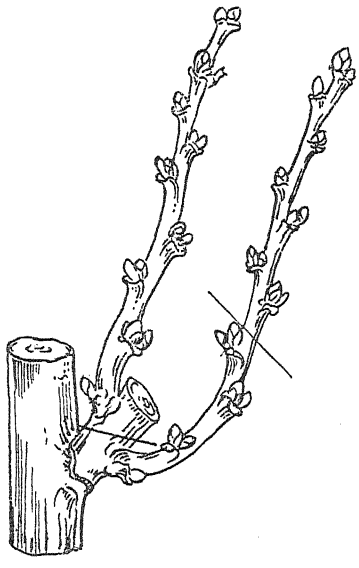


FIG. 39.—FRUITING SHOOT AND REPLACING SHOOT FOR NEXT YEAR.

The last growth is the coarse growth shoot which in the Pear or Apple we call a "water shoot," which usually springs from the lower part of the tree and is undesirable as a fruit producer but may be utilized as a replacing branch. It is really a growth shoot run wild.

We have therefore the wood shoot, the flowering and fruit shoot, the spur, and the water shoot to consider in our pruning, and each requires a different treatment.

The growth shoot is valuable when it comes in a position where an extension of the branch is desired, either at the top of an existing branch, or if at the base of an existing but unhealthy branch and thus serves to replace it. If weak, prune back in winter to two buds; if strong, to four, taking the best growth as the leader and pinching back the undesired shoots in June to two leaves.

The water shoot in an undesired place should have been suppressed by pinching in June and July, but if it has been allowed to grow it is cut back in winter to two buds, selecting later, as in the growth shoot, the best, and pinching out the others in summer. This water shoot will probably be $\frac{1}{2}$ inch or more in diameter at the base.

For the treatment of the anticipated shoots at the tip of a strong growth, in winter cut back to two visible buds at or near the base.

This point requires careful attention, as these buds are sometimes not at the base of the shoot but an inch or so above.

The fruiting shoot is pruned in winter to six good buds, which are both flower and growth buds together (see fig. 39). This should result in two new growths, one at the tip of the shoot, called in France the sap drawer, and one at the base, which is the replacement shoot for next year.

The tip shoot is only of use, as its name implies, for keeping the sap going, and in nourishing the fruit below it. When this shoot has made eight good leaves, pinch it back to four leaves, and if it shoots again, pinch again to four leaves.

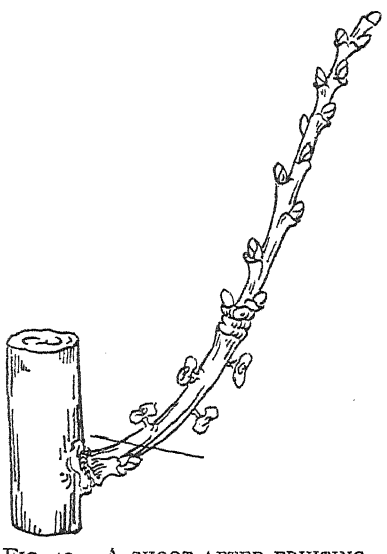


FIG. 40.—A SHOOT AFTER FRUITING, HAVING NO REPLACING SHOOT, MUST BE CUT DOWN TO A WOOD BUD.

This procedure may therefore be represented as the letter V: one side is fruiting while the other is growing to make a replacing shoot for the next season. A fresh V is next year made from the base of the replacing shoot, and so on, as far towards infinity as may be.

When the fruit has been gathered, the whole of the shoot which has borne it is cut away just above the replacing shoot (fig. 39).

When many flower buds are found on the fruiting shoot, those facing downwards should be removed, pinching them off entirely. Three or four to each shoot are quite enough.

The wood buds, which are often present next to the fruit (see fig. 37), will usually grow out, but as they are not required for next year, pinch them right out from the base.

Every care must be given to the replacing shoot for next year: it should be tied in when it gets half woody into the position it will occupy for next year's fruiting. This shoot is stopped by pruning at the tip when it is about 14 inches long.

All shoots which grow out in any undesired position, towards the wall or directly outwards, are pinched back to four leaves in May or June, and later should they grow again.

If we find in winter a shoot which has fruited (see fig. 40), and not pruned for a replacing shoot, it must be cut down to a bud at the base as shown.

By constant surveillance in summer we should control undesirable shoots and encourage useful ones.

Standard or Bush Peaches.—Though Peaches are usually grown on walls, they do quite well in the open in sheltered and warm districts. In the Thames Valley they frequently fruit on trees in the open. In

the angle of a warm wall a bush Peach of an early variety will fruit quite well, and needs little or no pruning, so it is an easy way for the amateur to start his experiences with this fruit.

As the branches bend down, fresh shoots are made from the top of the branch, and all that is required is pruning out after a few years infertile branches.

Under glass the standard and bush forms do admirably and, again, avoid much labour in summer pruning and tying in.

Varieties recommended.

Peaches:

Waterloo	Mid July
Duke of York	,, ,,
Hale's Early	End July
Kestrel	Early August
Peregrine	Mid ,,
*Crimson Galande	,, ,,
Goshawk	End ,,
*Royal George	Early September
*Bellegarde	Mid ,,
*Violette Hâtive	,, ,,
Prince of Wales	End ,,
*Nectarine Peach	,, ,,

Nectarines:

Cardinal (indoors)	July
John Rivers	Mid July
*Lord Napier	Early August
*Dryden	Mid ,,
Humboldt	,, ,,
*Elruge	End ,,
Darwin	Early September
*Pitmaston Orange	,, ,,
*Pine Apple	,, ,,
*Milton	Mid ,,
*Spenser	,, ,,

Those marked * are specially recommended for flavour.

WRITINGS ON THE ROSE.—II.

(*Cont. from p.* 132.)

By H. R. DARLINGTON, M.A., F.L.S.

[Read November 9, 1937; Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair.]

Books on Garden Roses, Nineteenth Century.—Returning to the books on Garden Roses in the nineteenth century, which opened with GUILLEMEAU'S Histoire Naturelle de la Rose (1800), an important work to be noticed is K. G. RÖSSIG'S Die Rosen, published 1802–1817 in parts consisting of fifty plates with a short description in German and French and an introduction. To these ten more plates by another hand were added, making sixty in all, but they are not of high artistic merit. The author, however, had a considerable knowledge of Roses, having previously published a descriptive work in two volumes on the economical-botanical aspect of the flower.

This was followed by H. C. ANDREWS' Roses, or a Monograph of the Genus Rosa, of which the first part was published in 1805, and the work was completed in 1828, illustrating some 100 species and varieties. This work will always be useful as a work of reference to the Roses of the period, but the plates have the hard and rather uninteresting quality to be found in nearly all the works of the latter part of the nineteenth century, and do not compare favourably with the beautiful portraits by Miss LAWRANCE.

In 1817 appeared the first part of P. J. REDOUTÉ'S Les Roses. REDOUTÉ will always be considered as one of the great artists of the flower. At the time of the appearance of his work he was Court painter of flowers at Malmaison, where the garden of the Empress Josephine was situate, and the cost of the drawings and engravings of the work was defrayed by the Empress.*

The letterpress of the work was provided by the botanist C. A. THORY, who contributed an introduction to the work and a copious explanatory text to accompany each plate, and the bibliography already referred to at the end of the first volume. The first edition was in folio size and the third volume was finished in 1826. In the same year a second edition in octavo size began to appear. In this the plates are reduced in size and most of THORY'S introduction and the bibliography are omitted. A third edition, also in octavo, was completed in 1830. Some rough classification is attempted in the arrangement of the plates, but for the most part the descriptions are written round and conditioned by the plates.

* Les Roses de l'Impératrice Josephine. By J. GRAVEREAUX. Paris, 1912.

Stimulated, doubtless, by the favour shown to the Rose by the Empress, Rose-growing in France made great strides about this time and several books and papers by French authors of varying merit appeared in the early part of the century. One of the most prominent was J. P. VIBERT, a nurseryman near Paris, who between 1819 and 1827 produced a book and some essays on the subject which Lord PENZANCE considered still worth attention in 1889.* VIBERT seems to have been one of the first to foresee the development possible by cross fertilization, and advocated wide experiment.

Another careful little book is PIERRE BOITARD'S Manuel Complet de l'Amateur des Roses, which among other things contains a short and useful bibliography. The Marquis DE CHESNEL wrote a Histoire de la Rose, apparently first published in 1820, a second edition appearing in 1838. For so small a book it is wonderful what a lot of matter he got into it. The legendary history of the Rose is treated at considerable length, but he has found room for adequate descriptive and cultural details.

Other works of this period will be found mentioned in Mr. A. W. PAUL'S article on the Literature of the Rose (JOURNAL R.H.S., **39**, p. 34).

In 1837 RIVERS, a nurseryman of Sawbridgeworth, published his Rose Amateur's Guide, a book which long remained a standard work of reference on Rose cultivation. Various new editions were called for, the last I have seen being the tenth edition published in 1872. Apart from its excellent cultural directions, which are as useful now as when they were written, it has the merit, from the modern rosarian's point of view, of being singularly accurate, and contains the most reliable descriptions of the Roses of his period.

In the following year, 1838, appeared Mrs. C. F. GORE'S Rose Fancier's Manual, a book based on her experience in France, which is mainly descriptive, but must have had a vogue in its time. Incidentally she gives us the date of introduction of *R. Hardyi*, "obtained this year (1838) by the accidental impregnation of that remarkable rose *R. Simplicifolia* . . . by a *microphylla* growing near it."

In 1844 WILLIAM PAUL brought out his first work on the Rose, a little book on Roses under Glass, which was well received and translated into several languages.

In the same year came the first American Rose book which has come to my notice, The Rose Manual, by ROBERT BUIST, which was followed in 1847 by The Rose: its History, Poetry, Culture, and Classification, by PARSONS, a New York nurseryman, which was for long a standard work for American growers. The history and properties of the Rose occupy 59 pages, the poetry 66, leaving 154 for culture, classification and description. There are two lithograph plates of 'La Reine' and 'Chromatella' respectively which, like all coloured plates of this period, however accurate, are hard and unattractive.

* Modern Roses. By Lord PENZANCE. 1889. JOURNAL R.H.S., 11, p. 209.

In 1848 WILLIAM PAUL published the first edition of The Rose Garden. This is the most important work published by an English nurseryman in the nineteenth century and its merits were at once recognized. A second edition appeared in 1863, and thereafter subsequent editions appeared every few years, the tenth being published in 1903. An eleventh edition came out in 1911, the title being changed to Roses and Rose Culture. The book is in quarto size and is divided into two parts, the first division including chapters on the History, Poetry, and Cultivation of the Rose, and the second division containing descriptions of the various cultivated Roses arranged in a useful Garden Classification, with an Appendix on the Botany of the Rose, which in the later editions was revised by J. G. BAKER. The ninth edition contained twenty full-page chromo-lithograph plates and numerous wood engravings. The majority of the coloured plates cannot escape the criticism applicable to most of the coloured pictures of Roses of this period, but there are a few that show a decided advance in colour representation, and are of considerable beauty. Though the Roses described in even the later editions are for the most part out of date, the book will remain of the highest importance to those who are now pursuing the vogue of the older Roses, and the careful directions as to cultural practice will remain as a monument to the care, observation, and learning of the author. In 1855 the book was translated into Danish, and by DOLL into German, and it has probably also been translated into French (see Preface to ninth edition).

In 1850 appeared the first volume of HENRY CURTIS'S Beauties of the Rose, which was completed by the second volume in 1853. The book is of quarto size and contains 38 lithograph plates in colour of garden Roses, with appropriate descriptions and the history of the varieties. The name is a little unfortunate, for the plates for the most part are hard and not beautiful, of which perhaps the author was conscious, for he states in the preface that the illustrations were prepared without the aid of a professed artist from the fear that "literal portraiture is too often sacrificed to pictorial effect." It may be of interest, as showing the Roses popular at the period, to note that the 38 Roses selected contain 21 H.Ps., 11 Teas and Noisettes, 3 Bourbons, 2 Chinas and 1 Moss.

In 1857 came the Cultural Directions for the Rose, by JOHN CRANSTON, a nurseryman near Hereford, a useful little book of 131 pages. The author was concerned with the dissatisfaction caused by Roses of poor growth, and makes his recommendations accordingly. Successive editions appeared at intervals, the seventh being published in 1888.

Then came two American books, SAXTON'S American Rose Culturist (1852) and PARKMAN'S Book of Roses (1866). In 1864 came SHIRLEY HIBBERD'S Rose Book. This is a thorough amateur's book and full of the ingenious author's gadgets, devices, and suggestions, presented in an attractive and readable form, which have delighted many generations of amateur rosarians; though it is probable that all of them may

not have met with the success in amateurs' hands that was expected, and possibly attained, by the author. Another edition was published in 1874 under the appropriate title of The Amateur's Rosebook.

For the most part I am not noticing foreign publications, but there is an important French work which should not be omitted. Somewhere about this time was published JAMAIN and FORNEY'S Les Roses—Histoire—Culture—Description. The second edition, which is that usually met with in this country, was published in 1873. The authors give a careful account of the beginning and development of Rose growing in France and, incidentally, the most complete history we have of the genesis of the Hybrid Perpetual. The descriptive part gives the Roses in vogue at the time, illustrated by sixty coloured lithograph plates which, though of much interest historically, have the hard outlines and colouring customary in coloured plates of the period. Nevertheless, it is a useful work and one to which those interested in the history of the Rose are likely most often to refer.

In 1869 the Rev. S. REYNOLDS HOLE (afterwards Dean of Rochester) published the first edition of his Book about Roses. Measured by its immediate popularity, and its effect on Rose growing in this country, this must be considered the most important English book on Garden Roses of the century. By 1877 it had reached its sixth edition, subsequent editions appeared till the end of the century, the last I have seen, to which the Dean wrote a preface, coming out in 1901, and in 1911 a reprint with an appendix by Dr. A. H. WILLIAMS, bringing the varieties recognized up to date, was published. It is perhaps the only Rose book which has found its way into NELSON'S cheap edition of English Classics. This book was much more than a mere manual of Rose Culture, and was in effect a plea for the detailed and personal cultivation of his plants by the amateur, and inaugurated a new era in Rose growing which has been immensely extended in the present century. Both the Roses that bear his name, the H.P. 'Reynolds Hole' and the H.T. 'Dean Hole' (which long maintained its place at the head of the list of exhibition Roses), are now obsolete, but the spirit of his book lives on and is still developing in the thousands of Rose gardens, large and small, throughout the country.

From about this time may be dated the beginning of the cheap and popular Rose books. One of the earliest was the Rev. O. FISHER'S Notes on the Art of Growing Roses Out of Doors, which originated in a contribution to the Gardeners' Chronicle, which was added to and published in book form and had reached its third edition in 1872. It was a little pamphlet of twenty-eight pages issued at the price of 6*d*.

For the next twenty years the sale of popular Rose books was maintained by various writers, of whom D'OMBRAIN is the most notable, but DUNCAN and PRIOR may also be mentioned, while from overseas came in 1882 ELLWANGER'S The Rose, the Dean HOLE of America, in 1887 BARTON WEST'S Roses in India and in 1890 R. G. ELLIOTT'S Australian Rose Book.

A great work by an English amateur came in 1894 in FOSTER-MELLIAR'S Book of the Rose, second only to Dean HOLE'S book, but very different from that work. It was severely practical, giving in minute detail the requisites of cultivation and ending with a chapter on "Manners and Customs," which was a careful survey of the garden Roses of the day. FOSTER-MELLIAR was a confirmed exhibitor who cared for little but the perfect beauty of the individual flower. The first part of his book may have appealed chiefly to others of his kind, but the "Manners and Customs" provided a new interest and was carefully studied by the ordinary gardeners throughout the country.

Three other less known books by amateurs finished the century: Mrs. BOYLE'S Ros Rosarum (1896), an anthology of the Rose; Lord BROUGHAM AND VAUX'S Roses (1898) and HELEN MILMAN'S (Mrs. CROFTON) My Roses and how I Grow Them (1899).

The Twentieth Century.—After the close of the nineteenth century the books on Roses become increasingly numerous, dealing with all aspects of the flower, and I must pass over many. In 1902 came Mrs. A. M. EARLE'S Sundials and Roses of Yesterday, and Miss JEKYLL and Mr. EDWARD MAWLEY'S Roses for English Gardens, which is largely occupied with the decorative value of the flowers and specially the climbing varieties. W. P. WRIGHT also contributed a volume on Pictorial Rose Growing, illustrated with coloured plates which, however, have not escaped the influence of those of the latter part of the previous century, and in 1903 JOHN WEATHERS published a book on Beautiful Roses with coloured plates, which are open to the like criticism.

In 1904 is the first edition I have seen of T. W. SANDERS'S Roses and their Cultivation, which reached its tenth edition in 1915, and J. C. SAWER'S Rhodologia is a discourse on the perfume of the flower and on the different methods of its distillation and extraction.

In 1905 JULIUS HOFFMANN'S Amateur Gardener's Rosebook was translated from the German by JOHN WEATHERS, and illustrated by coloured plates which are rather more pleasing than those of Mr. WEATHERS'S earlier book.

In 1908 there is a charming book on Roses and Rose Growing by Miss ROSE KINGSLEY, with really pleasing pictures, many of them coloured.

In the same year the Rev. JOSEPH PEMBERTON brought out the first edition of his book on Roses, a work of considerable but uneven merit, forming the third in the trinity of ecclesiastical amateurs (Dean HOLE, FOSTER-MELLIAR, and PEMBERTON), who may well rank in that order. The first half of PEMBERTON'S book purports to deal with the botany of the Rose, the second part with its cultivation, but PEMBERTON was a Rose grower, and not a botanist, and though the second part is excellent, the first leaves something to be desired, and is not always accurate. For instance, he gives *R. Ecae* as coming from Abyssinia instead of Afghanistan, and it is clear from the description he gives of that Rose that he can never have consulted AITCHISON'S

original description and figure of the Rose which are to be found in the Journal of the Linnean Society. There was a second edition in 1920. The illustrations, which (except for the frontispiece) are in black and white, are pleasing.

In 1910 appeared Miss WILLMOTT's great work on The Genus Rosa, with really beautiful illustrations by ALFRED PARSONS. The text is for the most part written to the plates, but she was assisted by J. G. BAKER, Keeper of the Kew Herbarium, who contributed the descriptions of specific characters and most valuable lists of synonyms.

This book, and that of Miss KINGSLEY above mentioned, seem to mark the emergence of coloured pictures of the Rose from the hard and rather ugly plates which marked the latter half of the nineteenth century. At the beginning of the century were Miss LAWRANCE's and REDOUTÉ's fine pictures, and after its close appeared these two beautiful works. Something of the same tendency in taste may be traced in the stained-glass windows of the several periods in our churches. Since Miss WILLMOTT's book the development of colour photography has greatly improved the beauty of coloured illustrations of the Rose, albeit the colours themselves may not always be reliable as yet.

In 1911 were published a little book of my own in the Present Day Gardening Series, DURAND's Book of Roses, the last edition of Dean HOLE's book, edited by Dr. WILLIAMS, HOLMES's Commercial Rose Culture, and Roses and Rose Gardens by W. P. WRIGHT, illustrated partly in colour. 1912 gave us SAYLOR's Making a Rose Garden, and 1913 a little book by Miss R. G. KINGSLEY on New Roses and H. H. THOMAS and EASLEA's Rose Book.

In 1914 came a book on Roses in Bombay by POTWARDHAM, and an American book by G. C. THOMAS, The Practical Book of Outdoor Rose Growing. This reached its fourth edition in 1917, and was followed by a Garden Edition in 1920.

Two years later H. H. THOMAS published another little book on Rose Growing for Amateurs, and in 1918 EDWIN BECKETT wrote Roses and how to Grow Them.

The War (1914–1918) had no doubt temporarily checked the production of Rose books, but this was resumed after its close, and the feature of the post-war works on the Rose is the number of books from America and the Dominions.

In 1920 came R. G. ELLIOTT's Australasian Rose Book, a careful book, with photographic illustrations in black and white, which pays special attention to the climatic conditions in various parts of Australia and New Zealand. In this country there was a book by G. P. SMITH, The Rose Garden for Amateurs, and in the following year two somewhat similar by FLETCHER and Miss HAMPDEN respectively, a work on the Genus by J. W. H. HARRISON, and on pruning by OWEN THOMAS, and in 1922 the first edition of HENSLOW's Rose Encyclopedia, of which an enlarged edition was published in 1934.

The year 1923 gave the American Rose Society's List of Standard Rose Names and McFARLAND's The Rose in America, a subject pursued in 1924 by G. C. THOMAS's Roses for American Climates. In this country, Sir J. COTTER's All About the Rose and SHERLOCK's Successful Rose Culture, and in 1926 a little book on Roses by WALTER BRETT.

In 1930 there were many Rose books from America, of which the most notable is McFARLAND's Modern Roses. In 1906 SIMON and COCHET had published a list entitled Nomenclature de tous les Roses Connus, which gave the name of the Rose, the section to which it belonged, the raiser, date of introduction, and colour, and McFARLAND's book is a descriptive list of all the important Roses in American commerce. With the assistance of these two lists something of the history and description of almost any Rose, and of every Rose of importance, brought out before 1930, may be ascertained. The descriptions, it is true, being often those of the raisers, are not entirely reliable, but many rosarians have found it a most useful record.

The other American books of this year were Dr. NICOLAS's Rose Manual, PYLE, McFARLAND and STEVENS's How to Grow Roses, and ROCKWELL's Roses, while from Australia came B. V. ROSSI's Modern Roses in Australia.

The remaining American books are STEVENS's Climbing Roses (1933), LEWIS's Book of Roses (1934), McFARLAND's Roses of the World in Colour (1936), an alphabetical and descriptive list illustrated by very numerous coloured photographs, an English edition of which has appeared this year (1937), and Dr. NICOLAS's A Year in the Rose Garden and A Rose Odyssey.

In this country Mr. CHARLES RIGG (1933) brought out a little book on Roses of Quality, a descriptive list of about fifty roses selected by the author, some of which are illustrated in colour, and Major MAPPIN, in 1934, issued Bigger and Better Roses which, though it deals with the usual topics of cultivation and exhibition, is largely a plea for more scientific application of manure.

The cult of old-fashioned Garden Roses has lately had its advocates, as shown by Mrs. KEAYS in America by her book on Old Roses (1933), and by Mr. E. A. BUNYARD in a scholarly book on Old Garden Roses (1936).

Quite a number of cheap popular books on the subject in paper covers, sold for about a shilling, have appeared in this period. Two of the best are WOOLLEY's Roses and how to excel with them (1926), and HART's Roses (1929), which contain an immense amount of information for the money.

French Writings.—A few French books of the twentieth century must be briefly mentioned. At the beginning of the century (in 1901 and 1902) were GRAVEREAUX and THEURIET's formidable lists of Roses cultivées à l'Haÿ, amounting as they do to close upon 7,000 varieties, and this was followed, in 1912, by GRAVEREAUX's charming description of the reconstruction he effected in the Empress JOSEPHINE's Garden at Malmaison.

I have already referred to SIMON and COCHET's Noms des Roses, which must have involved much labour in its preparation, and forms a most useful record.

In 1904 PAUL HARIOT brought out his Livre d'Or des Roses, an elaborate work more than half of which consists of chromo-lithograph plates of varying quality, many of them failing to escape the criticism passed on the coloured plates of Roses of the latter half of the nineteenth century.

An important work, Les plus belles Roses au début du XX^{e} Siècle, prepared by the Rose Section of the National Horticultural Society of France, appeared in 1922. This book has a certain historic interest in that it was formally presented to the English National Rose Society by M. L. VILMORIN (who had presided over the Committee responsible for its publication) at the International Conference on "The Modern Development of the Rose," held in London on May 20, 1912. Mr. PAUL thought very highly of this work, which consists largely of descriptive lists of Roses arranged in their appropriate sections, many of the flowers being illustrated in coloured plates, several of them of pleasing character, and, if we now find it of less practical value than of historic interest, it is well to remember, as Mr. PAUL reminded us, "that the climate of France is of many kinds and differs widely from our own," and it at least shows us how much more beautiful are the Roses we grow to-day than those with which we were satisfied forty years ago.

Of lesser works I may mention P. RIVOIRE'S La Rose (1909), COCHET-COCHET and MOTTET'S Les Rosiers (1909), which reached its fifth edition in 1925, and RIVOIRE and EBEL'S Roses et Rosiers (1933).

Periodical Literature.—In addition to the many and often excellent articles in the various Gardening Journals which appear from time to time, there is now a considerable periodical literature of the Rose.

WILLIAM PAUL started a Rose Annual in 1858 which was carried on down to 1862, and revived as a second series in 1877, which was continued down to 1881.

The Rev. H. H. D'OMBRAIN brought out in 1879 his Rosarian's Year Book, which was continued annually down to 1900, the series making twenty-two volumes in the Lindley Library.

Numerous papers have appeared from time to time in the Royal Horticultural Society's JOURNAL, the titles and references to the most important of which I have collected in a list which is to follow. Naturally enough these papers cluster to a great extent round the two Rose Conferences recorded in the years 1889 and 1902, but they are not confined to these periods, and almost every year one or more papers on the subject have appeared.

Then each of the greater Rose Societies has in time produced its annual volume.

Our own National Rose Society, founded in 1876, began its Rose Annual with a slender volume in a paper cover in 1907, which has yearly increased in interest down to date. The Annual first appeared in a cloth cover in 1910, under the direction of the late Mr. EDWARD

MAWLEY, and the first illustration in colour, being a photograph of a basket of Roses presented by the Society to Queen ALEXANDRA on Coronation Day 1911, appeared in 1912. In the next year four coloured plates appeared and they have gone on steadily increasing in number with each successive number of the Annual, the last issue (1937) containing sixteen plates. To look back through these numbers shows an interesting history of the gradual improvement in colour photography, and while it marks the advance that has been made, leaves us with the impression that it has yet some way to go before attaining real accuracy in colour demonstration. The later volumes have been edited by Mr. COURTNEY PAGE, Secretary of the Society.

The American Rose Society was founded in March 1899, and produced its first Rose Annual in 1916, edited by J. H. MCFARLAND, who has also undertaken the subsequent numbers. From the first a special feature of this Annual has been the record of particulars of all new Roses introduced in America or elsewhere, with appropriate descriptions and parentage, when obtainable, and in the later numbers an elaborate system has been devised, under the title of " The Proof of the Pudding," for obtaining the experience of these newer Roses gained by members throughout the country in their own gardens and their criticism of such experience. Having regard to the wide variation of climate in different parts of America, these criticisms are of considerable value.

The National Rose Society of Victoria was also founded in 1889 and issued the first Australian Rose Annual in 1928. In the following year they were joined by the similar Societies of New South Wales and South Australia, in 1933 by that of Western Australia, and in 1934 by that of Queensland. The editors have also kept in close touch with New Zealand and Tasmania, so that this Annual now represents in effect all these Dominions.

A comparative study of these three Annuals will be found to be of considerable interest. Though the object of the Societies is the same, their methods of attaining it vary in each case. All are excellent in their way, and no doubt typical of the constituents they respectively serve. The variation itself is of value and it is to be hoped that each will continue its own methods and not be unduly influenced by the methods of the others.

In France the Journal des Roses, founded by M. SCIPION COCHET about 1876, for long had a high position under the direction of the house of Cochet-Cochet, but ceased with the War. The organ of the French Rose Society is Les Amis des Roses, which appears every other month and is now in its forty-first year. In addition to recording the proceedings and activities of the Society, this journal gives detailed and useful information of the progress of the Rose in France and elsewhere, and contains from time to time interesting articles on various aspects of the flower and its cultivation, and in particular of the new Roses introduced by the French nurserymen.

In Germany the Rosen Zeitung, founded in 1886, is the organ of the German Rose Society, but is known to me only by name.

This review of the literature of the Rose has of necessity been brief and superficial. It is certainly defective in relation to recent foreign works on the flower which have come to my knowledge, but it at least shows how wide a field for investigation exists and how the cult of the Rose, originally confined in Nature to the Northern hemisphere, has spread by the agency of man to every part of the globe to which his civilization extends, and forms an integral part of that pursuit of the beautiful, which one would hope must ultimately promote the happiness, and in its common objective take some part in securing the peace and progress, of mankind.

Summary.—It may be convenient to endeavour to sum up the effect of this article, which is this:

In early times, as Europe gradually settled down after the barbarian invasions, the writings on the Rose came, with some exceptions, from a few monasteries, and for the most part consisted of extracts from or restatements of older books on Horticultural practice which had very often come down from classical times, the monks appearing to have little gift for original observation, or perhaps they were afraid of indulging in it.

After the middle of the sixteenth century the doctors stepped into the work, and began writing original books or notes on the subject. The Rose was a medicinal plant, and their notes and observations, begun on medical grounds, extended to the cultivation of the Rose as a garden plant and for its flowers.

A hundred years later (1650 and onwards) the medical aspect, though still of importance, began to be superseded by considerations relating to the garden value of the flower.

This effected something of a revolution, and during the next hundred years (1750–1850) the principal works, with few exceptions, were written either by nurserymen or by scientific writers on systematic botany. Twenty years later the Rose Show had become an institution of national importance, and shortly after the National Rose Society had been formed. This led to the acceleration of the amateur's interest in the flower and to the instruction of the amateur by amateurs, instanced and begun by what I have called the trinity of ecclesiastical writers, Dean HOLE, FOSTER-MELLIAR, and PEMBERTON.

The books of these three authors, and perhaps that of ELLWANGER in America, started an entirely new era in the writings on the Rose. Thenceforward books and magazine articles by amateur Rose growers become increasingly numerous. They are not for the most part scientific writings or concerned with the systematic botany of the Rose, but simple garden books dealing chiefly with horticultural practice, or the decorative value of the flower for garden or exhibition purposes in one or more of its many aspects.

The special feature of the writings of the twentieth century seems to be the increasing number of books or articles of this character from authors overseas—India, Australia, and other Dominions and Colonies, and specially from America—proving as it does how world-wide has become the interest in the Rose.

PLANTS TO WHICH AWARDS HAVE BEEN MADE.

Billbergia nutans. A.M. February 22, 1938. From Mrs. S. H. Whitbread, Biggleswade. This striking Brazilian plant is not uncommon in cultivation, and is not infrequently seen growing well as a window plant. It has a cluster of narrow, grey-green, toothed leaves with reflexed tips, from the midst of which rises an arching inflorescence about 18 inches high, bearing several rose-coloured bracts and five or six pendent flowers. The latter each have six perianth segments, the outer pink, the inner green, bordered with bright blue.

Cymbidium × 'Andromeda,' Harben's var. A.M. February 22, 1938. This beautiful hybrid carried a spike of eight well-formed flowers, of deep-cream colour, the labellum profusely spotted with crimson. The result of crossing *Cymbidium × eburneo-Lowianum* with *C.* × 'Flamingo.' Exhibited by G. P. Harben, Esq., King's Somborne, Hants.

Cymbidium × 'Claudette' var. 'Juno.' A.M. February 22, 1938. This pleasing hybrid bore an arching spike of fourteen flowers, the sepals and petals uniform light green, the labellum whitish with much small spotting. The parents are *Cymbidium × Coningsbyanum* and *C.* × 'Miranda.' Exhibited by the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey.

Cymbidium × 'Jeanette' var. 'Jeanine.' F.C.C. February 8, 1938. This vigorous hybrid between *Cymbidium × Alexanderi* and *C.* × 'Joy Sander' bore a tall spike with seven large flowers, the sepals and petals fawn-pink, the labellum white with crimson markings. Exhibited by the Hon. H. S. Tufton.

Cymbidium × 'Madonna,' Castle Hill var. A.M. February 8, 1938. The spike bore six well-formed flowers, blush-tinted, the labellum profusely marked with small crimson spots, the column rose-coloured. The result of crossing *Cymbidium × Alexanderi* with *C.* × 'Memoria P. W. Janssen.' Exhibited by the Hon. H. S. Tufton.

Cypripedium × 'Medway.' A.M. February 8, 1938. This unusually large flower has a round dorsal sepal which is white with dark crimson spotting on the central area. The petals and labellum are brownish-yellow with reddish markings. The result of crossing *Cypripedium* × 'Chardmoore' with *C.* × 'Windrush.' Exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Hippeastrum 'Edward Cartwright.' A.M. February 22, 1938. From R. F. W. Cartwright, Esq., Banbury. A fine seedling with large bright Tyrian rose flowers of good shape with veins of a deeper colour.

Homeria elegans. A.M. February 22, 1938. From T. T. Barnard, Esq., Wareham. A pretty South African species of Iridaceae. The

plant usually produces a single, erect, linear leaf about a foot long and a slender stem clothed with reduced leaves bearing one or more flowers. The perianth segments are subequal, about 1½ inch long, bright canary-yellow, the inner more or less erect, the outer somewhat spreading and marked with a conspicuous bronze, green-bordered blotch.

Odontioda × 'Beatrix' var. 'Jewel.' **A.M.** February 8, 1938. A beautiful hybrid obtained by crossing *Odontioda* × 'Gwendoline' with *Odontioda* × 'Melina.' The broad sepals and unusually large petals are almost covered with reddish-scarlet markings on a rose-tinted ground. Exhibited by Messrs. Charlesworth, Haywards Heath.

Odontioda × 'Minacis.' **F.C.C.** February 22, 1938. This distinct Odontioda bore a tall spike of nine well-formed flowers, of solid Indian-red colour in all the segments. The labellum bears a dull-orange crest, and the column a whitish anther cap. Obtained by crossing *Odontioda* × 'Acis' with *Odontioda* × 'Minos.' Exhibited by H. S. Wharton, Esq., Templewood Avenue, Hampstead.

Odontoglossum × 'Clonius' var. 'Colossus.' **A.M.** February 22, 1938. The spike bore eleven unusually large flowers having heavy reddish-rose blotching on a rose-tinted ground. Obtained by crossing *Odontoglossum* × 'Aquitania' with *O.* × 'The Czar.' Exhibited by Messrs. Charlesworth.

***Primula malacoides 'Duchess of Kent.'** **A.M.** January 28, 1938. From Messrs. Carters Tested Seeds, Raynes Park. Plant of erect growth, 12 inches tall; foliage medium green, flower stems erect, compact, produced in one crop. Flowers ⅞ inch diameter, bright rosy-carmine. A true stock.

***Primula malacoides 'Melody.'** **A.M.** January 28, 1938. From Messrs. Watkins & Simpson, London. Plant of sturdy compact habit; 9 inches tall; foliage strong, dark green; flower spikes many, arranged in a pyramid, produced in succession, rigid. Flowers 1 inch diameter, soft rose-pink with lemon eye. A good even stock.

* After trial at Wisley.

THE AWARD OF GARDEN MERIT.—XLIII.

By F. J. CHITTENDEN, F.L.S., V.M.H.

THE notes and descriptions of plants to which the Award of Garden Merit has been given, which have appeared in the JOURNAL from time to time since the Award was instituted in 1921, have been collected and published with some illustrations under the title Some Good Garden Plants. Descriptions of good plants of all types suitable for the outdoor garden, sufficiently common to be readily obtained, are included and arranged in alphabetical order. A key to the types of plants is given so that the notes on any type of plant can easily be found. The following supplement this book.

228. VACCINIUM CORYMBOSUM.

Award of Garden Merit, July 6, 1936.

Like most members of its family *Vaccinium corymbosum* demands a soil somewhat acid and free from lime. It will grow well in moist leaf-soil or sandy peat and will put up with, although it does not require, a certain amount of shade. It is one of a group of Eastern North American plants, allied to the Cranberry and called Swamp Blueberries, and related also to our own Whortleberry, which is common on heathy mountains and known by a host of vernacular names.

V. corymbosum is a twiggy rounded bush, generally 5 or 6 feet high, which bears rather thin entire ovate leaves tapering at both ends with very short stalks, varying considerably in size from 1 to 3½ inches long. Before they fall in autumn they turn red and it is to this the shrub owes its chief value for British gardens. The change is rather gradual and lasting and the bushes make, therefore, a striking picture in autumn, especially when associated with the evergreens of which the heath family contains so many—the species of Pieris, Kalmia, Rhododendron, *Vaccinium ovatum*, and the like.

In May before the leaves are fully expanded the flowers are borne in clusters of six or so at or near the ends of the last season's twigs. They are pendent on short stalks, tubular and narrowed at the mouth with five very short teeth, about ⅜ inch long, and white or white with a pink tinge. At Wisley the fruits are not very freely produced. They are berries about ⅜ inch wide and generally black covered with blue bloom, but they vary both in colour and size.

Two varieties, with foliage fringed with hair and serrulate, but not the type, have been illustrated in the Botanical Magazine, var. *amoenum* at t. 3433, with leaves bright green on both sides, and var. *pallidum* at t. 3428, with pale leaves, greyish beneath and sometimes hairy. Both require the same treatment as *V. corymbosum* itself and are equally good in autumn.

229. HELLEBORUS NIGER.

Award of Garden Merit, March 10, 1930.

Helleborus niger, the lovely white Christmas Rose, grows wild among shrubs mostly on limestone in its typical form in the European Alps, especially in the eastern half, the Tirol, the Vorarlberg, the Schneeberg and the Hungarian alps for instance, usually up to about 4,000 feet, but in Bavaria as high as 7,000 feet, while a larger-flowered variety (*H. niger macranthus*) is found in the southern foothills of the alps in Provence, Switzerland, Tirol, Croatia, etc.

The natural habitat is not always a safe guide to garden treatment, but here it gives just the indication the cultivator needs. A sweet or even a limy soil with leaf-mould so that it is never too dry and never over-wet and slight overhead shade, these are the main requirements, and, after planting, patience, for the plants usually take some time to settle in. When once established they should be left undisturbed. It is probably the need for patience and for peace that accounts for the fact that it is in the old gardens of the country cottage, the vicarage, and the manor where this fine plant flourishes. Yet it is worth a place in all gardens. It flowers in January or even at the end of December, and in order to see the flowers at their best it is well to put a pane of glass a little above them, lest they become smirched through splashing of rain. In the typical plant the flower stems are only about 4 or 5 inches long and thus the flowers are very near the earth.

H. niger varies a good deal through its range and several forms are to be found in gardens. The common form has moderately long-stalked leaves and the flower stalks are practically straight. The fine variety *altifolius* has long-stalked leaves and nodding flowers, the stems generally long and bearing numerous small leaves. Its flowers are large and often tinged with rose, while both leaf and flower-stalks are flecked with red. The variety *macranthus* has matt bluish green instead of dull green leaves and larger usually perfectly white flowers. This is sometimes called *H. niger angustifolius* from its narrower leaves and is the *H. niger vernalis* of SWEET's British Flower Garden, Series 2, t. 186.

BOOK REVIEWS.

"The Garden Beyond." By Marion Cran. 8vo. 316 pp. (Jenkins, London, 1937.) 6*s*.

Mrs. Marion Cran has paid a visit to Kenya and, interspersed with autobiography, she tells us something of the gardens she saw there and of their characteristics, and not only of these but of various experiences in gardens elsewhere. Those who have read Mrs. Cran's earlier books will know what to expect here. They will, we are sure, not be disappointed.

"The Passing Show." By W. E. Johns. 8vo. xiii + 112 pp. (*My Garden*, London, 1937.) 5*s*.

A series of not too serious articles reprinted from the monthly parts of *My Garden*, where they first appeared, with remarks on the behaviour of plants in the author's garden and elsewhere in a humorous vein.

"Herbs and Herb Gardening." By E. S. Rohde. 8vo. xiii + 206 pp. (Medici Society, London, 1937.) 8*s*. 6*d*.

Most readers of books about gardening are familiar with Miss Rohde's style. The lore of the old writers flows freely from her pen, there are anecdotes of her own doings and experiences, there are pen pictures of plants as seen through her own eyes, and there are some hints as to how to do things, and the result is always an entertaining mixture. The present book is illustrated by photographs of various garden scenes in most of which some herbs play a part, one or two plans of gardens of herbs which the author has designed, and a number of excellent line-drawings of some of the plants mentioned by Miss H. Coley and Miss G. Caroe.

The preface tells us that the subject is treated "chiefly with a view to the making of a herb garden and the use of herbs for decorative effect in the flower garden." That being so, we fancy some will go to it expecting full details of cultivation and treatment as well as arrangement. The last chapter is devoted to "The Making of a Herb Garden and some Recipes," and it stretches to twenty-two pages, of which the recipes occupy a considerable part, anecdotes some, notes on what old writers have said about Winter Cherry and Honesty some more, so there is not really much about cultivation after all.

Tastes, of course, differ, but except for its associations few would long desire to see "the golden-tasselled flowers of the stately Elecampane" in their garden, and if they sought "the blues of Borage, Anchusa and Catmint," they would find them in the first two but certainly not in the herb Catmint, *Nepeta Cataria*, the flowers of which are dirty white. Can the author have been confusing it with *Nepeta Mussinii*, which some might perhaps include in a blue garden? And do the 12- or 14-foot stems of the Roses with which she surrounds her herb garden really belong to the Sweet-brier of Elizabethan times, which was *Rosa rubiginosa*, and not rather to the Penzance Briers which we owe to Lord Penzance in the nineteenth century?

Miss Rohde much praises the stately herbs and recommends among them, quite rightly, *Angelica Archangelica*, and she put it in her garden in front of the Sweet-brier and next the Rosemary. With *Anchusa italica* in front, Roses behind, and Mulleins on the other side, poor Rosemary must needs shrink into her corner, especially if Angelica gets really going as it should, and does its best with its great handsome foliage to shelter (and probably smother) Rosemary—as it certainly will in soil where *Mentha rotundifolia* reaches a height of 6 feet. Several of the combinations suggested through the book are not likely to "work" where the soil is good—*e.g.* Comfrey and Marigolds is suggested, but surely to the ultimate detriment of the Marigolds, which, it is hinted, the Comfrey will support; but after all the pot Marigold can well support itself.

If it is really intended to gather herbs for their various purposes, is it wise to suggest Aconite as a denizen of the herb garden? It is, wrongly used, a deadly poison, and accidents easily happen. Even though it is to be grown associated with Elecampane, that sovereign remedy for so many ills would not cure one who licked the root of its neighbour Aconite in mistake.

We may take it that the great majority of herbs cannot be grown at the same time for beauty and for use—many by the time their beauty is developed are too far advanced for the herbalist's or druggist's purposes. The book is no sure guide to the commercial exploitation of herbs, and, indeed, does not pretend to be, although it more than hints at the commercial value of some.

It would be easy to multiply instances of disagreement with the author, but enough has been said to indicate that she has produced another book which will give pleasure to read, and to suggest that personal taste and others' experience should both be consulted if one essays to plant a herb garden.

"William Shenstone: An Eighteenth Century Portrait." By A. R. Humphreys. (Cambridge University Press, 1937.) 6*s*.

Shenstone's qualities as *pensée* writer and landscape gardener received scant notice from his contemporaries—authors such as Walpole, Mason and Johnson, whose attitude for various reasons may be described as one of pique towards the master of The Leasowes, failed deliberately to give him his due—while worthy nineteenth-century critics considered his work too frivolous to merit their weighty words of wisdom. It remained for Professor Saintsbury and Havelock Ellis to open our eyes to the influence of Shenstone as a precursor of the Romantic Movement—to set him where he belongs, together with Collins and Gray, as a far-off pivot of the Age of Sentiment which formed a delicate balance between the extremes of the Augustan and Romantic periods.

Since Havelock Ellis "discovered" Shenstone as a minor philosopher we have had at least three authors devoting entire works to analyses of this extremely pleasant and interesting eighteenth-century personality, and, significantly, each writer ceding more space to Shenstone as a garden-maker than his predecessor. Here, at last, is a scholar who weaves the striking pattern of the landscape art of England into the complicated tapestry of eighteenth-century thought and life; in a section of the present volume called "The Quest of the Sharawadgi" (a term borrowed from the "Chineses" by Sir William Temple, and one that might well be revived, implying, in brief, the theory of asymmetrical composition), the author discusses the sources of inspiration which gave rise to that important manifestation of "taste," the picturesque landscape garden. Although he does not accord this neglected phenomenon quite the importance which is due to it, any work which treats with understanding of what is perhaps the only characteristically English art must be received with gratitude, and this appreciation of the genius of Shenstone is especially welcome for the detached manner of its writing and the impartiality of the author's attitude towards a character which can easily be over-sentimentalized. Because of this viewing of Shenstone through the wrong end of the telescope, as it were, Mr. Humphreys's estimate of "The Leasowes' Damon" is as satisfying as any that has as yet appeared. Though it is now too late to save The Leasowes, which has become a golf course with a view of factory chimneys, it is to be hoped that this book's influence may help to establish the creator of England's most noted *ferme ornée* among the company of Kent and Brown, whom he exceeded in natural talent and imagination, as the rare artist and connoisseur of landscape gardening which he appeared to his own circle.

CHRISTOPHER TUNNARD.

"The Observer's Book of Trees and Shrubs of the British Isles." 16mo. 240 pp.

"The Observer's Book of British Butterflies." 16mo. 191 pp.

Each compiled by W. J. Stokoe. (Warne, London, 1938.) 2*s*. 6*d*.

These little books, small enough for a child's pocket on a country walk, and informative enough for the lover of country things, are well printed and well illustrated both in black and white and in colour. All the British butterflies are dealt with in the one, and all the British trees and several that have been introduced from other countries are described and illustrated in the other. They are excellent little books.

"North American Rock Plants." First Series. By W. H. A. Preece. 8vo. xv + 204 pp. (Macmillan, New York, 1937.) 15*s*.

In the preface of this attractive book the author quotes from a letter received from a prominent British grower: "We are finding more and more that most American and Canadian alpines and woodlanders are too difficult for the ordinary gardener." Many plants certainly have the reputation, but why? Importations of wild plants have often proved unsatisfactory; parcels arrived badly packed and were far too long in transit, and seeds are frequently very disappointing. But the main fault is the absence of useful information of their

behaviour in gardens and insufficient knowledge of natural conditions. This book, dealing with both, fulfils an actual want. However, there is a serious omission not confined to this particular publication. The author, to judge by the foreword, appears to live in Victoria, B.C., but forgets to write about his soil and even worse, of climatic conditions, rainfall, extremes of temperature and so forth. This must spell failure for many because his appeal is addressed to the growers of his immense continent and the many gardeners of this small island.

It will come as a revelation to most cultivators in this country that large tracts of the North American continent are on limestone formation and the flora frequently calciphilous, especially on screes. This may sound unpleasant to some of our " acid " friends, who believe as little in the virtue of lime as an abstainer in alcohol. Yet from this direction salvation may come. Mr. Preece is an evident believer in lime and in scree, for which he claims full success. Apparently he does not object to sub-acid conditions for the wood dwellers, and in many respects his observations are similar to ours. After all, climatic conditions of Vancouver approach ours much nearer than those of Eastern North America and, *mutatis mutandis*, British Columbian experience may be proved useful in Britain. Of the 100 species illustrated and described, we have tried more or less successfully about forty. Mr. Preece has no need to apologize for his century of " Alpines " which contains woodlanders and meadow species. They are taken at random, easy and difficult, rare and common, and thus present an admirable picture of the north-western flora.

He renders a sober account of his friends which he describes in field or garden. Occasionally he might have augmented his information, he might have told us, for instance, that *Aquilegia Jonesii* is a limestone plant and apparently not prodigal in flower. The photographs are often taken in his alpine house, unessentials are blacked out and on the whole they prove very satisfactory. Is the author certain that the illustration of *Lewisia Tweedyi* really represents the true species ? British examples are much better. We can assure him that the raising of Leiophyllum from seed will take even longer than he imagines. We do not consider *Silene Hookeri* a difficult plant in England. However, one ounce of experience is worth more than a hundredweight of theory.

We believe that this book will prove a very useful addition to the library of British growers and be of real help. As we are promised further series, may we suggest that they should comprise more of the rarer and difficult species and add, *vivant sequentes !*

P. ROSENHEIM.

" Flowers in House and Garden." By Mrs. Constance Spry. 1a. 8vo. xvii + 179 pp. (Dent, London, 1937.) 12*s.* 6*d.*

This very charming book is a mine of information on all subjects connected with gardening. Mrs. Spry is evidently a keen gardener, and, apart from flower decoration, many useful hints for growing flowers are to be found in the various chapters.

Part I is chiefly concerned with what to order and how to grow the many delightful plants and bulbs mentioned, but it also suggests ideas for decoration in the house. For the first nine months of the year, each month has a separate chapter, but the last three are grouped together.

Part II deals entirely with decoration as regards flowers, vases and backgrounds. The various examples given are quite excellent and should be of great assistance.

Many people neglect the decorative value of the old-fashioned Geranium, and it is therefore specially pleasing that Mrs. Spry devotes considerable space to it, and also supplies a useful list on p. 25 : plants of all kinds are well described, and not only are there comprehensive lists of them but—what must be very helpful—information is given as to where they can be obtained.

A special mention is made on p. 96 of the white Daffodils, and this should do much to bring them more to notice. Their beauty is not realized so freely as it should be, and they are now comparatively cheap and easy to obtain. One of the best decorations I have ever seen was during the war, when a large bowl of Narcissus ' Madame de Graaff,' arranged loosely with its own foliage against a pale green wall, looked perfect.

The illustrations are a great feature of this very delightful book, which should appeal to all lovers of flowers and of gardening. Lady Moore, at the conclusion of her excellent Foreword, says, " This book should go far to giving us ' new eyes '." It will be generally agreed that, after reading it, we shall be able to see from another and better angle the value of many old as well as new plants, both for indoor decoration and for the beautifying of our gardens.

LADY BEATRIX STANLEY.

NOTES AND ABSTRACTS.

Adenium swazicum Stapf. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 664; July 1937). -Native near Barberton, with a large succulent underground stem from which short branches arise bearing dark red flowers about 2 inches across.—*F. J. C.*

Allium Alaka Gmel. forma **major.** By W. B. Turrill (*Bot. Mag.*, t. 9506; Jan. 1938).—A plant from N. Persia which varies a great deal under different conditions. In cultivation the scape, up to 4 inches long, bears a dense, globular umbel of eighty to ninety pale purplish flowers; leaves two, about 13 inches long by 2 inches broad. Apparently hardy.—*M. S.*

Berberis chillanensis var. **hirsutipes.** By T. A. Sprague (*Bot. Mag.*, t. 9503; Jan. 1938).—*Berberis chillanensis* was described in the JOURNAL, R.H.S., **58,** xxix, and the present variety closely resembles the species, differing only in its minutely and densely brownish-pilose shoots and pilose peduncles. Further research may prove both merely forms of *B. montana.* A hardy shrub from the Andes of Argentina.—*M. S.*

Cadaba termitaria N. E. Br. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 656; April 1937).—A shrub up to 15 feet high, native in the Transvaal, Griqualand West, etc. Leaves small crowded on short shoots. Flowers small.—*F. J. C.*

Calamintha alpina orontia Hayek. By W. B. Turrill (*Bot. Mag.*, t. 9508; Jan. 1938).—A hardy variety from Herzegovina and Yugoslavia, distinguished from nearly-related varieties by its ovate- or orbiculate-spathulate, slightly crenate-serrate lower leaves, the long spreading hairs on the calyx, and the pale violet flowers. Originally described as *Satureia orontia.* It is treated most successfully as a biennial, since it later assumes an irregular and loose habit and becomes susceptible to winter wet.—*M. S.*

Camellia saluenensis macrophylla. By J. R. Sealy (*Bot. Mag.*, t. 9505; Jan. 1938).—This species was collected by Forrest in the Yunnan, and a full description and discussion of its nomenclature will be found in the JOURNAL, R.H.S., **62,** 363–9. The present form, differing from the type in its larger leaves, is found only in cultivation. A tender shrub.—*M. S.*

Chinese Compositae [Neue und bemenkenswerte chinesischen Compositen]. By H. Handel-Mazzetti (*Notizbl. bot. Gart. Mus. Berlin-Dahlem,* xiii, no. 120, pp. 607–661; illus.; 1937).—Describes new Chinese species of Anaphalis, Aster, Atractylis, Cacalia, Cremanthodium, Gerbera, Jurinea, Myriactis, Saussurea, Senecio and Vierhapperia (new genus, with a weedy-looking plant, *V. hieraciphylla,* Forrest 12780, as the only species known), collected by Forrest, Rock, Farrer, Purdom, Wilson and others. It also contains a useful synopsis (pp. 615–627), with a key, of the Chinese Asters related to *A. alpinus.* The author criticizes Onno's dissertation, Geograph.-morph. Stud. *Aster alpinus* u. verwandte Arten (*Bibl. Bot.*, 106; 1932), regarding many of Onno's determinations as incorrect and his conclusions untenable. Handel-Mazzetti recognizes twenty-eight Chinese species: *A. Farreri* is distinguished as a species from both *A. diplostephioides* and *A. Lipskyi,* but *A. Purdomii* (Bot. Mag., t. 8476) is considered synonymous with *A. flaccidus,* and *A. Forrestii* with *A. Souliei* var. *limitaneus.* There are also notes on the synonymy of other species.—*W. T. S.*

Cotyledon leucophylla. By R. A. Dyer (*Fl. Pl. S. Afr.*, t. 652; April 1937).—A poisonous species from the Transvaal with large obovate succulent leaves clustered towards the ends of the branches, and pendent red flowers in a dense paniculate cyme.—*F. J. C.*

Eucalyptus coccifera viridifolia. By V. S. Summerhayes (*Bot. Mag.*, t. 9511; Jan. 1938).—A rather more floriferous variety than the type, with dark green, usually narrow leaves, glaucous only when young. Probably, like the typical *E. coccifera,* hardy in the milder parts of Great Britain, and probably also native in Tasmania, though known at present only in cultivation.—*M. S.*

Euphorbia Vandermerwei. By R. A. Dyer (*Fl. Pl. S. Afr.*, t. 660; April 1937).—A dwarf succulent-stemmed Euphorbia with spines in pairs. Flowers red.—*F. J. C.*

Gardenia Rothmannia Linn. f. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 657; April 1937).—Already figured in Bot. Mag. t. 690, a beautiful shrub from near Pretoria with white flowers spotted brownish-red near the throat.—*F. J. C.*

Gasteria excelsa Baker. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 665; July 1937).—A Cape species, with variegated leaves and branching spikes of pink and green narrow tubular flowers.—*F. J. C.*

Gazania Munroi. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 659; April 1937).—Related to *Gazania pygmaea* with flowers about 1½ inch across with yellow ray-florets.—*F. J. C.*

Hippeastrum Blumenavia. By J. R. Sealy (*Bot. Mag.*, t. 9504; Jan. 1938).—A native of South-east Brazil, described as *Griffinia Blumenavia* in 1867, and as *Hippeastrum iguapense* in 1903. The petioled, narrow leaves up to 4¾ inches long, resemble those of a Griffinia, but in all other respects it is a typical Hippeastrum. About 8 inches high, with four or five white funnel-shaped flowers streaked mauve-crimson, horizontal at first but soon drooping. *M. S.*

Holubia saccata Oliv. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 661; July 1937).—An nanual native of the Transvaal, Bechuanaland, etc. Spreading with reddish succulent stems, opposite leaves, white flowers about 2 inches long and over an inch wide at the mouth, and 4-winged reddish fruits over 2 inches long.—*F. J. C.*

Homoglossum merianella Baker. By E. Milne-Redhead (*Bot. Mag.*, t. 9510; Jan. 1938).—A Cape species previously described under various names; received an Award of Merit in 1936, and described in the JOURNAL, R.H.S., **61**, 177. A plant for the cool greenhouse.—*M. S.*

Hoodia Dregei N. E. Br. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 670; July 1937).—Succulent, grooved stems about 10 inches high and 2 inches thick. Flowers almost flat, dirty yellow with a pinkish area round the corona.—*F. J. C.*

Leptaloe blyderivierensis. By Groenwald (*Fl. Pl. S. Afr.*, t. 651; April 1937).—Found on the Drakensbergen, a species with narrow white-spotted leaves and a cluster of light green flowers with pink suffusion at the top of a 16-inch scaly-leaved scape.—*F. J. C.*

Leucospermum conocarpum R. Br. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 667; July 1937).—A shrub growing on Table Mountain to about 10 feet high, with ovate leaves tipped at the almost truncate apex with brown teeth clothing the crooked stems. The terminal tufts of flowers are pale yellow.—*F. J. C.*

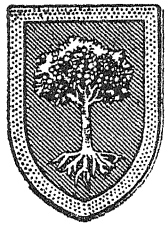
Leucospermum Gerrardii Stapf. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 668; July 1937).—A dwarf plant about 10 inches high with many ascending hairy stems, hairy linear leaves and terminal umbels of scarlet hairy stems.—*F. J. C.*

Ligneous Plants described by H. Léveillé from Eastern Asia, Index to notes on. By A. Rehder (*Journ. Arnold Arb.*, xviii, pp. 278–321; 1937).—Hector Léveillé (1864–1918) of Le Mans had no rival from 1898 to 1918 as a prolific describer of "new species" from eastern Asia, particularly western China. His descriptions are mostly inadequate or misleading, and he often referred specimens to genera or even families where they do not belong. His "new species" of Embelia, for example, belong to Celastrus (Celastraceae), Embelia (Myrsinaceae), Gaultheria (Ericaceae), Rhamnella (Rhamnaceae), and Schisandra (Schizandraceae). Léveillé's type-specimens have now been studied by Rehder and other botanists; notes regarding them have appeared in Wilson, *Lilies E. Asia* (1925); *Notizbl. b. G. Berlin-Dahlem*, **11**, 329–330 (1932), *Notes R.B.G. Edinb.*, **17**, 146–147 (1931), *Journ. Arnold Arb.*, vols. **10–18** (1929–37), Handel-Mazzetti, *Symb. Sinicae, Anthophyta* (1929–36). Léveillé proposed about 1,300 new names for trees and shrubs; of these about 1,100 are now regarded as synonyms; from Rehder's Index their correct names and further information about them may be quickly found.—*W. T. S.*

Limosella maior Diels. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 655; April 1937).—A marsh plant growing near Pretoria, with radical leaves about 2½ inches long and small pink flowers on pedicels about the same length.—*F. J. C.*

Nerine angustifolia Baker. By E. P. Phillips (*Fl. Pl. S. Afr.*, t. 658; April 1937).—A Transvaal species. Flowers six to nine, dark pink, with narrow undulate segments, on hairy pedicels.—*F. J. C.*

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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May 1938

FORTHCOMING EVENTS.

THE weather of March has certainly been most delightful but a little difficult for those who wish to prophesy what may be on show during the month of May, especially at the Chelsea Show, but there is always much there of interest for the whole of the gardening world.

One result of the remarkable spring is to render it doubtful whether the date announced for the British Delphinium Society's Show, June 30, may not prove too late and it is possible that an earlier date may have to be chosen. Fellows interested may obtain any information available on application to the Secretary.

There will be one Fortnightly Show in May, on May 10 (12 noon–7.30 P.M.) and May 11 (10 A.M.–5 P.M.) at which the second competition for Sewell Medals will be held. Particulars of this competition were published in the January JOURNAL, p. 31.

At 3.30 on the afternoon of May 10 a lecture on " Flower Decoration " will be given by Captain H. STEVENS.

The Chelsea Show will be held in the Royal Hospital grounds from Wednesday, May 25 until Friday, May 27. Particulars of the hours of opening for Fellows and the prices and hours for the admission of the public are printed on the backs of the tickets. For Fellows and Associates, however, there will be a private view on Tuesday, May 24, starting at 2 o'clock, and for the benefit of those arriving before 2 o'clock the Ranelagh Gardens, where it will be possible to obtain light refreshments, will be open. The special invitations admitting to this private view will be sent out about ten days beforehand.

The Automobile Association has again supplied the Society with a circular, enclosed in this issue of the JOURNAL, giving the official traffic arrangements and parking places together with a map showing the entrances to the Show Grounds. The traffic requirements may

entail a diversion of traffic to the Embankment entrance owing to congestion at the main entrance on the Royal Hospital Road and it would be a great convenience for the traffic organization generally if more use were made of the Embankment entrance.

Will Fellows kindly note that self-propelled and invalid chairs cannot be admitted on Wednesday, May 25, but on Thursday and Friday, May 26 and 27, they will be admitted between the opening hour and 12 noon. A charge of 5s. for each chair accompanied by one attendant will be made, but for those using self-propelled chairs, if unaccompanied by an attendant, there will be no extra charge.

On June 8 (12 noon–7.30 P.M.) and 9 (12 noon–5 P.M.) there will be a Fortnightly Show in combination with the Iris Society and their Show (the Iris Society's Show opens at 1 P.M. on June 8). On account of the uncertainty of the season some arrangements for the Iris Show may need revision. The third competition for a Sewell Medal, see January JOURNAL, p. 31, will be held, and on this occasion only one medal is offered and that for an amateur's exhibit.

Entries for the Sewell Medal competitions of May 10 and June 8 must be made on special forms obtainable from the Secretary and the completed forms must be received not later than by the first post on the Wednesday preceding the Show.

On the afternoon of June 8, at 3.30, there will be a lecture by Mr. G. P. BAKER on "Irises for Beginners." The members of the Iris Group are invited to attend.

On the afternoon of June 9, at 3.30, a lecture will be given by Lady ALLEN OF HURTWOOD, F.I.L.A., under the auspices of the Institute of Landscape Architects, on "The Future of Landscape Architecture in England."

The second Fortnightly Show of June will be held on June 21 (12 noon–7.30 P.M.) and June 22 (10 A.M.–5 P.M.) and also the London and South of England Viola and Pansy Society's Show.

A competition for amateurs for Flowering Shrubs is to be held on June 21, and the following Classes have been provided :

Class A.—8 varieties of hardy shrubs in bloom, not more than 2 of any one genus.

Class B.—1 vase of a hardy shrub in bloom.

In the Old Hall on the same dates and times the Cactus and Succulent Society will hold their Show.

On the afternoon of June 21, at 3.30 there will be a lecture on "Old-fashioned Roses," by Mr. E. A. BUNYARD, F.L.S.

THE LILY GROUP.

There will be a meeting of the Lily Group on May 10, at 4.30 P.M., in the Restaurant of the Old Hall, and members will be invited to put questions on any matter connected with Lilies, Nomocharis or Fritillaries.

On June 21, at 4.30 P.M., in the Restaurant of the Old Hall, there will be another Lily Group Meeting when a discussion on " The Arrangement of Lilies in the Garden " will take place.

WISLEY GARDENS IN MAY.

As the dry warm weather in March brought very many trees and shrubs into bloom considerably earlier than their normal season it is probable that the same advanced state will be apparent in vegetation in May.

Visitors may therefore expect to find the Daffodils over as well as the Crab Apples and many Lilacs. Rhododendrons and Azaleas will be in full flower in the Wild Garden together with the Primulas in the earlier part of the month, and such June-flowering plants as *Meconopsis betonicifolia*, Hemerocallis, bearded Irises, Cistus, Nomocharis and the first of the Lilies may be expected before their wonted time.

In the Half-Hardy House the pink sub-shrubby *Ebenus cretica* is an unusual and attractive feature. The scarlet flowers of *Lotus Bertholetii* set on a mat of silver-grey foliage, with the yellow Odontospermum and brilliant red *Rochea coccinea* are amongst other plants to be found here.

The Temperate House contains the magnificent scarlet Bottle-Brush, *Callistemon citrinus splendens*, Fuchsia species, and the curious Bird-of-Paradise flower, *Strelitzia Reginae*, having crests of blue and orange.

In the Trial Grounds Irises, Lupins, and the Belladonna Delphiniums are likely to be the principal collections flowering at this time, and they will be closely followed by the Hemerocallis, Paeonies, and Sidalceas. The Alpine House and Rock Garden are now gay with a great variety of suitable plants, amongst which may be mentioned Primulas, Ramondias, Saxifrages, Lewisias, *Meconopsis quintuplinervia*, *Daboecia azorica*, and Pentstemons. In the beds near the former the species of Cistus and their allies begin their season of bloom, and no shrubs are more lavish of flower than they.

Other shrubs in the Wild Garden besides the Rhododendrons and Azaleas already referred to will be *Magnolia Wilsonii*, with pendent white saucers, and perhaps its sweet-scented relation *M. Watsonii*, the Kalmias, Vacciniums, and *Enkianthus campanulatus*. Such Primulas as *P. pulverulenta* and the pink Bartley strain, *P. japonica*, *P.* ' Red Hugh ' and others will be at their peak of bloom.

Erica arborea alpina and *E. australis* are the latest and tallest of the spring-flowering Heathers in Seven Acres, but the various species and hybrids of Brooms (*Cytisus*) with the double form of the common Gorse take up the tale of flower in the Heath Garden, whilst in the borders Berberis and Cotoneasters, Spiraeas and Viburnums, and the lovely *Dipelta floribunda* are some of those shrubs which contribute their share of blossom.

Visitors who pass through the Pinetum to Howard's Field may find the latest of the Lilacs still flowering in the very large collection there, and towards the end of the month the first of the many species of Rosa and some of the old garden Roses may open buds in the borders beside the river bank.

There has been some addition made to both these sections during the past planting season, and in this part of the Gardens are also to be found many species and hybrids of Cistus and Halimium flourishing in the sandy soil.

British Diploma of Floral Art.

At the Society's Spring Examination for the Floral Art Diploma, which was held on March 16 and 17, ten Diplomas were awarded to the following successful candidates :—

Miss Mary Blackwall.
Mrs. Louisa Bowles.
Miss Gwendoline Lillian Hilda Corden.
Miss Winifred Elise Deacon.
Miss Frances Margaret Dearlove.
Miss Sylvia Gertrude Paula Estler.
Miss Margaret Wybrants Hamilton.
Miss Hilda Ivy Martin.
Miss Alice Elsie Margaret Piper.
Mr. Francis Hardwick Ward.

We are glad to record that the examiners were well satisfied with the work of the candidates which showed considerable improvement over previous examinations.

There will be an Autumn Examination for this Diploma, held at Torquay in connexion with the Florists' Conference there, on September 28 and 29. This is an experiment made in order to widen the interest in the examination and to make it easier for provincial florists to attend.

The syllabus and particulars of the examination can be obtained from the Secretary.

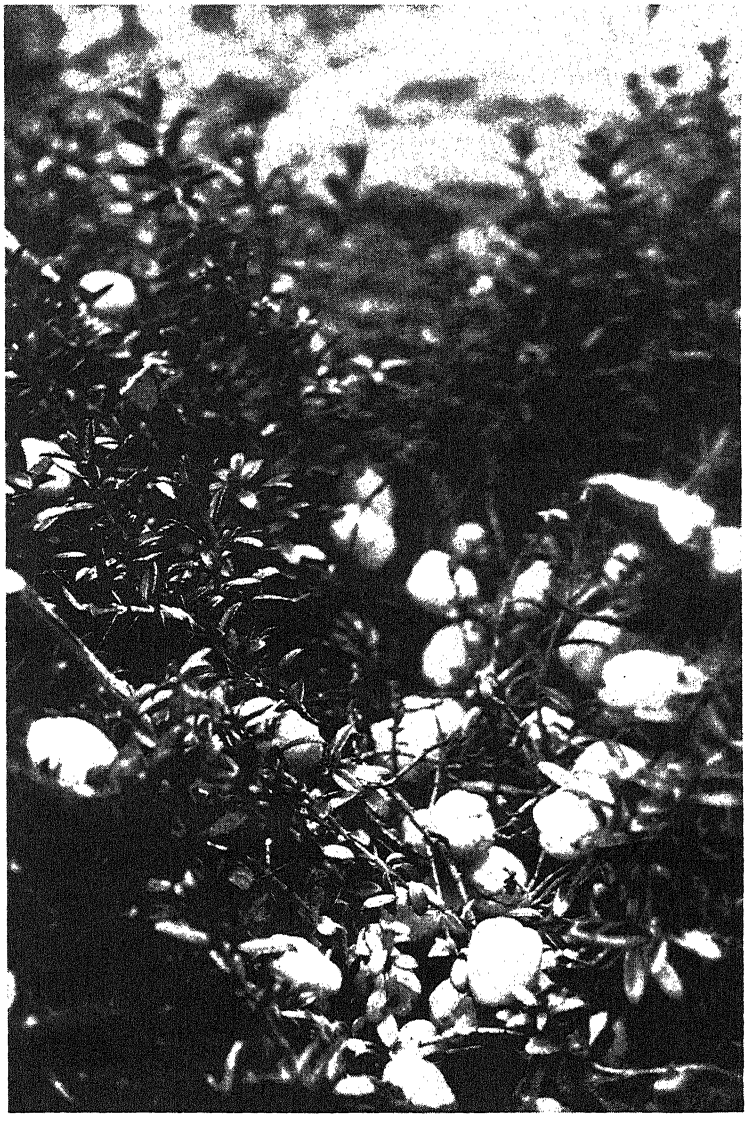


FIG. 41.—GAULTHERIA TRICHOPHYLLA.
Foliage parted to show fruits.

[*To face p.* 200.



FIG. 42.—GAULTHERIA MIQUELIANA.

GAULTHERIAS.

By A. T. JOHNSON, F.R.H.S.

IT was not without some hesitation that I accepted an invitation to write on Gaultherias in the JOURNAL, for I claim no learned intimacy with the genus. But on understanding that merely some notes in my amateurish way on Gaultherias as we have found them in our own garden would be acceptable, the subject lost its more formidable aspect.

Briefly described as evergreen under-shrubs and members of the Ericaceae, with cylindrical or bell-shaped flowers and fruits consisting, in most cases, of a swollen and persistent calyx, often brightly coloured, Gaultherias are citizens of many lands. Europe and Africa they have omitted from their itinerary, but they flit about the rest of the globe with frolicsome caprice, cropping up as isolated settlers, or as long-established colonists, in most of the great continents from the North to the Antipodes, from North America westwards to China and Japan, India and Ceylon.

That plants of such diverse climates and conditions should present some difficulties to the gardener here who essays to grow them out of doors might be expected. But, notwithstanding, we have found most Gaultherias fairly tractable creatures, so much so that instead of fussing over individual attention, we accord them all much the same treatment, and if some do better than others results on the whole are good. That treatment practically amounts to this: we give them the same care that is bestowed upon one's choicer Rhododendrons. The lime-free soil of our Conway Valley garden, on the light side and well-drained, is sandy-alluvial on the flat, shaly on the slopes, and before planting the customary procedure is simply to fork in a generous ration of sorbex and well-matured garden refuse—largely decayed leaves.

Part shade is the standing order, but although the more robust kinds will endure tree roots and drip, and so make excellent undergrowth for woodland, we find that flower and fruit are more abundant where the plants get a few hours of daily sunshine. Some, indeed, like *Gaultheria trichophylla* (fig. 41) and *G. procumbens*, will take all the sun the gods give them and rejoice therein, but only so long as the natural moisture of the soil is sufficient to equalize the loss of that moisture by evaporation. That, of course, is a precept which applies to many things, but I do think that Gaultherias in particular appreciate a soil that is uniformly moist and cool and not subject to extremes, and all mat-forming species naturally tend to secure such a condition for themselves by slowing down evaporation with a green counterpane of their own weaving.

An essential qualification in anyone attempting Gaultherias is patience. I do not find them more resentful towards being moved than many kindred plants, but they are, as a family, uncommonly slow at first in getting away, and nothing will stir them into activity until they are ready. But once their base supplies and lines of communication are made secure, once they have started on their way those underground branches by which they increase in an ever-widening clump, or colony, they will make steady progress. Even *G. procumbens*, a plant that can be very aggressive when established, will sometimes hesitate for a couple of seasons before making a real move.

G. procumbens, having been in our gardens for nearly 200 years, may well take precedence in dealing with such species as we possess. But it has other claims, and one of these is its usefulness as a woodland carpeter. Its reddish 6-inch stems are tufted with leaves that are redolent of "wintergreen" and a burnished green, and its pretty rosy-white bells and the holly-red fruits which succeed them in autumn are singularly attractive. Under tall trees it will, in its own leisurely way, make a dense ground cover that is pleasant at all seasons, often carrying into midwinter the red and bronze with which autumn warms up its rich bay-green.

Another American is our old friend *G. Shallon*, with its bold foliage on red twigs, and pink flowers. This we find admirable for covering any woodland or rough place which one would not offer to anything better. Yet, that is hardly just, for *G. Shallon*, which may be anything from a stubby dwarf of 6 inches to an impenetrable thicket of as many feet in height—form as well as soil being a governing factor—can be a most useful plant, as indifferent to bog as it is to the aridity of rocky soil beneath pines. I have known it even to do good service as a wind-break, and its cheerful green, like its willing temper, puts up with anything without a complaint.

With the exception of the two mentioned we have found the Gaultherias of western North America rather unreliable. But so far as our collection goes these consist only of *G. humifusa* (*Myrsinites*) and *G. ovatifolia*. The former, a wee squat little fellow of 2 or 3 inches, with ovate or heart-shaped deep green, leathery leaves, has given us rosy-white bells and a few bright red fruits, but it finds a Welsh glen a poor substitute for a buttress on the Rockies. It lives, but it does not prosper, and its very near ally, *G. ovatifolia*, is rather less content, and perhaps a little susceptible to frost. *G. ovatifolia* makes a loose-habited plant of 8–9 inches. The semi-procumbent zigzag branches are slender and lax, and the broadly ovate leaves are thinner and more drawn out at the points than those of *G. humifusa*. But the pale blush-pink campanulate flowers and red fruits are much like those of the last-mentioned. Indeed, the two species have many features in common, and I have a feeling that *G. humifusa* at all events would be happier were it given the more open treatment that a rock garden ledge would afford. It appears to be quite hardy.

Crossing the Pacific to Western Asia we come to one of the six

best garden Gaultherias, *G. Miqueliana* (fig. 42) of Japan, long known as *G. pyroloides*. This beautiful species, making a colony of sturdy, erect 9-inch stems with thick net-veined oval leaves about an inch in length, is a delightful thing for a cool fairly open woodland bank. Its apple-green foliage is always pleasant and the white bell-like flowers, often borne in racemes, are as pretty as lily-of-the-valley. In the later summer the blossoms give place to fruits which, up to ½ inch wide, are snow-white, sometimes flushed with carmine on the weather side, and these, if not devoured by the beasts of the field, we have until those of *G. cuneata* come to remain nearly the whole winter through, sharp frost excepting.

G. Miqueliana is a good and hardy garden plant, not so given to sulking as some, and it spreads with commendable alacrity—if such a word can be used in connexion with the genus. But, even so, we find *G. cuneata* (once classed as a variety of *pyroloides*) still better, in so far as it is less subject to that partial "die-back" common to many Gaultherias, and to which its ally is not exempt. *G. cuneata* (fig. 43), in every way an excellent species, might, I take it, be regarded as the Chinese *Miqueliana*, for with the latter it has many features in common. But the Chinaman is taller, its leaves are more narrowly oval and glossier, the fruit, as I have said, is later and the plant more compact and bushy, often presenting a dense dome of twigs and foliage 12–18 inches high. The white or pink-flushed fruits are produced in abundance and are extraordinarily persistent.

Rivalling the foregoing in ornamental merit and garden worthiness is the much discussed *G. tetramera* (fig. 44). This appears to be the correct name for the plant we have for long known as *G. Forrestii* and which was accorded the **A.M.** under that name in 1927. But in accepting that decision the fact remains that there is, to a garden eye, considerable dissimilarity between the plants most of us grew under FORREST'S name twenty years ago, and described by Mr. BEAN (Trees and Shrubs, vol. III), and those much more recently received labelled *G. tetramera*. And the difference lies not only in the colour of the "berries," size and shape of leaf, but in habit and stature.

However, *G. tetramera* is generally seen as a loosely built shrub of 2–3 feet or more, with narrowly oval, but variable, thick, netted leaves of a bright green, axillary racemes or clusters of little whitish flowers and almost globular fruits about the size of an average pill. In colour these fruits (autumn-winter) vary so considerably with us that they may be anything from a leaden purple to violet and a most brilliant blue of the purest dye, and a well-cropped bush of this Gaultheria adorned with these gleaming blue beads is surely one of the loveliest objects of the sort in Nature. Most of our plants, it is curious to note, produce as fig. 44 shows, some 5-parted fruits as well as the regular 4-parted, even on the same shoot. Happily, this fine Gaultheria is fairly hardy, not fastidious, a good grower and willing to be propagated from cuttings, though, like most others, layers, suckers or seed are more certain means of increase.

Although the true *G. Forrestii* has not yet entered the fold so

far as we are concerned, it must have a passing word of courtesy. But, dealing as I am only with those species that we have grown, let it be enough to say that, so far as one can gather, there is one important garden difference between this plant and *G. tetramera* which ought to be mentioned and it is this: while the latter species is (or can be) pre-eminent in fruit and dismally weak in blossom, *G. Forrestii* excels in the conspicuous beauty of its white flowers, but makes no pretence to being ornamental in fruit. This plant of FORREST'S is not in commerce, but some happy gardens possess it, and on being exhibited a few years ago by Mr. GEORGE H. JOHNSTONE of Trewithen it was granted the Award of Merit. Since this particular exhibit had inadvertently spent the night before the show in somebody's dust-bin, the capturing of that honour provides no little testimony as to the quality of its flowers.

In a woodland retreat, partly sunny, we have, along with *G. tetramera*, the Japanese *G. adenothrix*. As yet only some 8 inches, this is a charming little plant with ovate rich green 1–1½-inch leaves on angular reddish stems, sturdy and erect. In the earlier summer it yields almost globular drooping white blooms flushed with pink, and these, being close upon ½ inch wide, are, I think, the finest effort in individual flowers made by any of our Gaultherias. Holly-red fruits come along later, and the plant gives every promise of being permanent and content. Under similar conditions, but I fancy it is less hardy, we have *G. Cumingiana*. Said to hail from Formosa, this is an elegant shrub with slender and whippy zigzag red branches, set with thin ovate leaves, pale green and lustrous, with finely drawn points. Axillary racemes of rosy-green bells appear at midsummer and later on—too late for them to develop thus far—are borne dull red fruits the size of buck-shot.

The Chinese *G. Veitchiana*, obviously akin to the Himalayan, *G. Hookeri*, is one of the easiest and most robust of our Gaultherias. In any average Rhododendron soil this amiable species will grow into a dense thicket, 2–3 feet high and neatly rounded. The obovate, or oblong leaves, up to 3 inches in length, leathery in texture, a full-toned green, distinctly net-veined and often finely toothed, are carried on bristly twigs. At the terminal axils are borne in summer 1–1½-inch racemes of nodding, urn-shaped white flowers, but the conspicuous bracts which accompany these being a delicate pink when exposed, the racemes of a plant blooming in an open sunny spot assume a lovely rosy effect. That rough description will pretty well cover the sister species, *G. Hookeri*, but this in the form we grow is broader and larger in leaf, the green is deeper and more burnished and the habit even closer. Both plants are handsome evergreens and both bear fruits as large as small holly berries of a wonderful indigo-blue, but they do not always "set" their yield so successfully here as one would wish. On the assumption that they may do better in this respect with more sun we are trying some plants with full exposure, not forgetting the necessary moisture.



FIG. 43.—GAULTHERIA CUNEATA.

[*To face p.* 204.



FIG. 44.—GAULTHERIA TETRAMERA.



FIG. 45.—GAULTHERIA NUMMULARIOIDES ON A WOODLAND BANK.

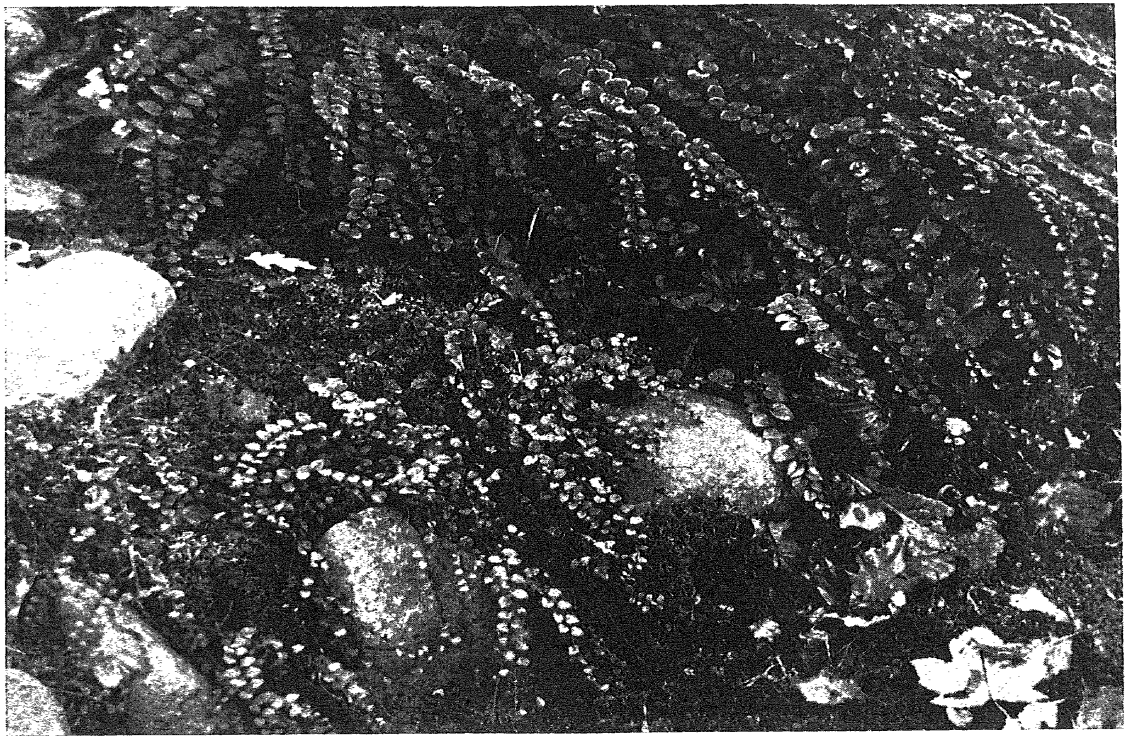


FIG. 46.—GAULTHERIA NUMMULARIOIDES AND G. NUMMULARIOIDES MINOR.

[*To face p.* 205.

With such larger kinds as the foregoing we have had *G. fragrantissima* for a long while. A scarce plant in the trade a few years ago, this species (India, Ceylon) is now frequently offered, and since it "survives out-of-doors at Kew" (BEAN) it may be considered hardy enough for all but the bleakest localities. There is a cousinly likeness to *G. tetramera* in its hard, oblong pointed leaves on red stems, but these are longer (often 3–4 inches), and though the shrub has here made a loosely set bush of only 3–4 feet, it is said to grow very much taller. The white, slightly fragrant flowers, in axillary racemes, are succeeded by violet-blue fruits according to some authorities, but in our plants these may be anything from a pale starch blue, almost white, to plum-blue. As in other species, and other genera, berry colour is so often influenced by the season and perhaps soil, that the gardener who, in his haste, discards a shrub because its fruits are not up to tone may live to repent it.

G. Griffithii is another Himalayan, but so hardy that I have not seen it even slightly injured, and it has endured 25 degrees of frost. It has not got much above a foot with us, but would doubtless exceed that in more open places than we have it. Beneath our trees and shrubs in any cool light loam it spreads with remarkable zeal, making a thick-set undergrowth of its sprawling zigzag red branches and ample furnishing of narrowly oblong, pointed leaves, which, 1½–2 inches long, are a fresh and taking green with an inclination to droop. Its whitish flowers are the forerunners of a plentiful crop of little round fruits, but I have not seen the youthful green of these mature beyond a faint purple hue. But *G. Griffithii* is such a hearty shrub, so emphatic in asserting its supremacy as a thrifty and agreeable woodland ground cover, that one need not worry over its shortcomings.

Then we have another shade carpeter of inestimable worth in *G. nummularioides* (fig. 45), a plant that will do for banks, stumps or rocky places what *G. Griffithii* does for the level. There are not many shrubs of the sort that we value more highly than this Himalayan, with its long rusty-furred branches, lax and trailing, closely set with opposite cordate bristly leaves, about ½ inch across, but prettily graduated in size to the tapering ends, as are those of the familiar 'Creeping Jenny.' Given a free woodland soil in at least partial shade and such companions as the smaller hardy ferns, *G. nummularioides* is delightful at all seasons, slowly covering several square feet with its throng of overlapping growths, but always, I think, looking its best when draping a slope. It is quite reasonably hardy, but detests cutting winds, and it produces on the undersides of the branches drooping bells in a dull pink. But, though we have grown this species for thirty years, the black fruits Mr. W. J. MARCHANT tells us it yields we have not yet seen.

However, *G. nummularioides* has a pocket edition of itself which does not get so far as to flower. With us at all events, this dainty plant, rightly or wrongly known as *G. nummularioides minor* (fig. 46), remains

flowerless, but it is an engaging little mite, and though less than one-quarter the size of the type in leaf is ambitious enough to make trailing growths which in length alone may rival those of its bigger sister. But in this respect *G. nummularioides minor* has a challenger in F. 2522 (*G. nummularioides minuta* ?), a Chinese plant which, while it bears a general resemblance to the other, differs in several particulars. Thus the hairy growths of FORREST's plant are perfectly prostrate and they root as they thread their way about (for a couple of feet or more), which those of *minor* rarely do. The ovate leaves are more pointed and distinctly spine-tipped, they are glaucous beneath and finely toothed, and the plant makes amends for the sterility of its affinities by bearing in quantity brown-red bells and plum-black fruits the size of sweet pea seeds. F. 2522 promises to make a better garden Gaultheria than *minor*, though it will demand more room, and being a true creeper it can claim no little distinction in a genus so generally devoted to suckering as a means of progression.

G. trichophylla (fig. 41) is a plant of the rarest charm, and it was probably to it more than to any other that our fall to the family was due. What particular quality it is in the lesser Ericaceous plants which exerts so subtle a fascination over one I do not pretend to know, but I do know that this little waif of the loftier Himalayas possesses that insinuating "pull" to a greater degree than most.

Running freely by underground stems in a coolish bed of friable vegetable soil, *G. trichophylla* weaves a tousled rug of very slender interlaced mahogany-coloured growths of 4 inches or so thickly beset with narrowly oblong, dark glossy green hairy leaves about $\frac{1}{8}$ inch wide and $\frac{1}{4}$ inch long. Enjoying our humid glen, the plant carries this foliage year in and year out with unchanging brightness and in early June puts forth rosy-red bell-like flowers. In an incredibly short time these give place to fruits which, more or less pear-shaped and as large as horse-beans, are a lovely thrush's-egg blue. Nor is that all, for before this August crop has disappeared a second one is prepared for, so that by early autumn we have the festival of those beautiful "berries" repeated just as before. A bad mover, save in clumps, *G. trichophylla* may be raised from seed, but how in a natural state the plant disperses its seeds one cannot guess, for the fruits are usually so sunken among the leafy detritus at the base of the growths that they are often entirely covered up. We give this delectable atom light shade as a rule. One of our older colonies is thriving in conditions that suit its companion, *Rhododendron radicans*, through which it is boldly threading its way, the two plants intermingling in a most amicable manner.

Even smaller in foliage than *G. trichophylla*, with polished, almost linear leaves each about the dimensions of a grain of rice and closely arranged, is *G. thibetica* (K.W. 6845). This winsome shrublet of 6–8 inches stands stiffly upright. It bears in the later summer top-shaped flowers, very contracted at the mouth, and these, rosy-green, broadly lined with red, are succeeded by violet fruits. So far, this

has not been touched by frost, and it wears the healthful look of the happy and content.

To what extent, if at all, the Asiatic Gaultherias hybridize in Nature I do not know. But those of New Zealand, as Sir ARTHUR HILL pointed out some years ago, frequently do so to the confusion of both botanist and gardener. Nor do they stop at that, for bi-generic hybrids with Pernettya have occurred in cultivation as well as in the wild. To a casual observer this may not be surprising, for Gaultheria and Pernettya are so closely akin that even the botanists, it seems, have not always found it easy to tell " t'other from which." Thus the New Zealand *G. perplexa* (of the Kew Hand List) is, I believe, now called *Pernettya macrostigma*, but, notwithstanding, I cannot resist offering a meed of praise here for this delightful shrub.

As a plant *G. perplexa*—to use the old name—is dismal enough, an untidy bundle of interlaced wiry twigs economically provided with a few dull green, linear leaves. But from November on to spring this gloomy creature is adorned with racemes of frost-proof fruits as large as marrowfat peas, and in a rose-carmine so vivid that even the birds discreetly leave them alone. Personally, I nurse a mild resentment that Gaultheria should have been robbed by Pernettya of this, one of its most brilliant fruiting members; and again one feels a certain " sense of something lost " on realizing that *Pernettya furiens*, a boldly distinctive bush of 4 feet, will no longer adorn the Gaultheria family as one of its most beautiful flowering species.

G. perplexa is, in our garden at all events, the only one of the southern Gaultherias which is absolutely hardy, easy-going and long-lived, and this gives one another cause for regretting its removal from the familiar ranks. *G. antipoda* may perhaps come next in frost resistance, but of this I fancy there are several forms, differing in hardiness, since the plant is said to inhabit both the North and South Island of New Zealand as well as Tasmania. However that may be, *G. antipoda*, as I know it, is a thin-habited, more or less erect, bush of 18 inches or so with leathery, oval-obicular, finely serrated, almost stemless leaves closely arranged. These leaves, about ½ inch wide, are glossy and a dull bronzy-green, the small pearly flowers are carried in short axillary racemes and yield sparingly blood-red fruits the size of peas. *G. rupestris* is so near to *G. antipoda* that the twain are difficult to separate. Dr. STOKER, for whose enlightenment in these matters I am indebted, gives (in Shrubs for the Rock Garden) the main points of difference between the two species very clearly. I gather that he, like ourselves, has discovered that to a mere gardener the fact that while *G. antipoda* is a tolerably " good life," *G. rupestris* is generally dead, will be sufficient to go upon for most of us.

G. depressa is, again, like *G. antipoda*, but smaller in all its parts and inclined to be procumbent. The thick little leaves (3/16 inch wide), rounded and crenulate, are often a bronze-purple in winter with red undersides, and the modest white flowers that appear singly at the upper axils give place to crimson fruits of unusual size, perhaps ½ inch

in width. (There is also a variety with white fruits which Mr. MARCHANT assures me are as large as the red.) This is a fairly hardy and taking little shrub and, in common with its congeners mentioned, it seems more content to sit in a self-contained clump than to indulge in the suckering so characteristic of northern Gaultherias.

The tall *G. oppositifolia* (North Island, New Zealand) we find unable to resist the frost of even a moderate winter. But being one of the handsomest of the genus in flower and fruit we hope to give it further trial now that particularly congenial quarters have become available. Meanwhile, since I write only of what we have, *oppositifolia* must be dismissed with that brief notice, and the mention of two more southerners, *G. hispida* and *G.* × *fagifolia*, will bring our round-up of the genus pretty near to an end.

To grow *G. hispida* (fig. 47) well has long been one of our ambitions, but it has not yet been an unqualified success, for it, more than any other, is liable to that strange " die-back " referred to as not infrequent among Gaultherias, an entire branch, or even several, suddenly dying from no apparent cause. *G. hispida* (Australia and Tasmania), which we have had up to 2 feet or more, is a stiff upright shrub with reddish young wood and almost stemless, lance-shaped, 1–2 inch leaves, dark green, thick of texture and sharply pointed. The urn-shaped flowers in axillary panicles are a good firm white and very striking against the sombre foliage, as are the ½-inch snow-white " berries " which come on in early autumn. This attractive species is quite reasonably hardy. That it has a grievance is manifest, but of our winters it has no serious complaint. Yet, if it does indulge in that piecemeal dissolution referred to, the fact that the word " replace " is so often against it in the garden book means that the plant has found enough favour in our eyes to induce us to persevere with it.

G. × *fagifolia* is the wild-born child of *G. oppositifolia* and *G. antipoda*, and the bastard is here making a much better garden plant than the former parent, while in good looks it triumphs over the other. With us it has grown into a lax, sparsely branched shrub of some 18 inches, and it seems quite winter-immune and content. The almost orbicular glossy leaves, notched and waved at the margins, are much like those of *G. antipoda*, but smaller and a brighter, purer green. Little white flowers are produced abundantly and the " berries " are also white, like sugar-coated pills, but I understand these fruits may be rose-flushed or a full-toned red. The name, *G.* × *fagifolia*, evidently alludes to the resemblance of the leaves to those of one or other of the evergreen southern Beeches—probably *Nothofagus Cunninghamii* or *N. Menziesii*.

A concluding paragraph may be devoted to a few Gaultherias of which I have had but little experience, most of them still having to pass their reliability trials. *G. pyrolaefolia* is one of these. Sent here some time ago as *G. reticulata*, this Sikkim species bears no little resemblance to *G. procumbens* in its lowly mat-forming habit, red stems and pedicels and terminal tufts of roundly ovate dark green



FIG. 47.—GAULTHERIA HISPIDA.



FIG. 48.—VIBURNUM MACROPHYLLUM.
As grown by Mr. C. Scrase-Dickins, V.M.H.

[*To face p.* 209.

leaves, an inch or more in length. The white, or rosy, pitcher-shaped flowers and red fruits also suggest *G. procumbens*. But, so far, the leaves of *G. pyrolaefolia* with us have not attained the size of those of *G. procumbens*; they are rounder, thicker—extraordinarily thick—much more reticulated, not nearly so glossy or so aromatic as those of the American plant. Since *G. pyrolaefolia* was collected at an altitude of 13,500 feet by the Everest Expedition (BEAN) it should be hardy enough, and some plants in a trial bed stand out with healthful promise among some rather shabby-looking companions.

Another species, in the style of *Veitchiana*, which has made a robust clump in a very short time, now full of flower buds and vigour, accompanies the label, F. 304. Its name and identity I have not yet discovered, but it bears the banner of great hopes—and when it does bloom may turn out to be a Vaccinium. *G. sinensis* (K.W. 8562), also only on the eve of flowering here, is a pretty 6–8 inch bush of erect, rather lax growths closely set with narrow, raspy, small-toothed leaves, the whole somewhat suggesting a sunburned tuft of *Satureia montana*. Its white flowers are said to yield "saxe-blue fruits" (MARCHANT) and I do not suspect it of tenderness. *G. Merrilliana* (Japan), a neat, bright green, rather frail-looking little 6-inch plant, with a narrow heathy foliage and manner, was granted a Preliminary Commendation last July when shown from Exbury. It is said to be very beautiful when bearing its white or rosy fruits, but along with the rest of these late arrivals, including the handsome *G. Wardii*, it must be numbered among the untried for a season or two so far as this garden is concerned.

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

LXXXIV.—FURTHER EXPERIMENTS WITH GROWTH SUBSTANCES AND THE ROOTING OF CUTTINGS.

By M. A. H. TINCKER, M.A., D.Sc.

THE intention of this article is to report the further work carried out at Wisley on the use and value of various growth substances for vegetative propagation. In the R.H.S. JOURNAL, 61, p. 510, preliminary results were reported of tests made with lanolin pastes and dilute solutions of the various chemicals then readily available. Of the plants then tested some were known to root readily from cuttings. Subsequent tests have been made with a very much wider range of species and varieties, including plants known to propagators to be relatively difficult to root and others notoriously difficult. At the same time further experience has been gained of the methods, and a wider range of chemicals has become available; proprietary articles have also appeared on the horticultural market and attention has been paid to the claims made for such articles.

The available material consisted chiefly of hardy shrubs and herbaceous perennials. The majority of the tests have been made with stem cuttings, but other materials such as root cuttings and leaves have also been employed.

The results of the great number of tests are here arranged in various categories according to the methods used and the results obtained.

I. THE PASTE METHOD OF APPLICATION.

In this method the active substance is applied in lanolin as a paste. Owing to the sticky nature of the "solvent" it is not easy to apply small quantities of uniform weight. The method is therefore inconvenient. The tests also show that generally it cannot be considered highly efficient.

The following list of treatments carried out shows details of substances used and their concentration. In each test twenty, or frequently fifty cuttings, were used. Later reference will be made to these treatments by number.

A. Control Series :
0. Cuttings placed direct in frames without treatment.
1. Application of anhydrous lanolin (*Adeps lanae*) 1 gm. on each cutting, applied to outer tissue near the base, on severance from plant.

A. Treatments :
1 gm. of lanolin paste as above containing :
2. $\frac{1}{100}$ gm. of β-indolyl acetic acid.
3. $\frac{1}{1000}$ " " " " " "
4. $\frac{1}{100}$ " " α-naphthalene acetic acid.
5. $\frac{1}{1000}$ " " " " " "

A. Treatments : 6. $\frac{1}{1000}$,, ,, phenyl acetic acid.
7. $\frac{1}{10000}$,, ,, ,, ,, ,,
8. $\frac{1}{1000}$,, ,, iso-indolinone.
9. $\frac{1}{10000}$,, ,, ,, ,,
10. $\frac{1}{10000}$,, ,, alantoin.

B. Control Series : 11. Application of pastes 7 days before severance. 1 gm. lanolin.

B. Treatments : 12 as 11 ; but with $\frac{1}{100}$ gm. of β-indolyl acetic acid.
13 ,, ,, ,, ,, ,, α-naphthalene acetic acid.
14 ,, ,, ,, ,, ,, phenyl acetic acid.

C. Control Series : 15. Before application of lanolin the tissues were cut to expose the cambium to direct action of pastes.

C. Treatments : 16 as 15 ; with $\frac{1}{100}$ gm. β-indolyl acetic acid.
17 ,, ,, ,, ,, α-naphthalene acetic acid.
18 ,, ,, ,, ,, phenyl acetic acid.

Results.—The results obtained are shown for the various species and varieties tested by these paste methods in alphabetical order of generic names and show the month in which the cuttings were taken, the experimental procedure by reference to the foregoing numbers, and observations recorded on subsequent behaviour of the cuttings in regard to rooting and the success of the propagation test. Unless otherwise stated, the material used comprised stem cuttings of the usual pattern, nodal cuttings were used where that is the usual garden practice, and internodal when customary usage required such. After treatment, the cuttings were inserted into pure sand in cold frames or in frames in a cool greenhouse. Any interesting observations regarding abnormal behaviour are here recorded.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Acacia diffusa . .	November	12, 13, 14	Rooting not induced.
Alnus rotundifolia .	April	1, 4 ✔	Buds on treated cuttings greatly retarded, and all rooting unsatisfactory.
Anchusa italica (roots) .	August	1, 2, 3	Rooting facilitated by treatment, leaf-buds retarded. Polarity influenced.
Begonia Rex (leaves) .	August	1, 3	Tissues damaged.
Antirrhinum speciosum	March	1, 2, 3, 6	Slight acceleration of growth of roots, increase in number.
Asparagus officinalis .	April to August	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	No roots formed.
Buddleia alternifolia .	July	1, 3, 4	Rooting accelerated by treatments.
Calceolaria violacea .	April	1, 2, 4	Slight damage of soft tissues, rooting not induced.
Diervilla florida . .	July	1, 3, 7, 16	Rooting accelerated by treatments.
Freesia refracta (corms)	October	0, 1, 2	Rooting accelerated, flowers four days earlier.
Hamamelis japonica .	March	15, 16, 17	Buds retarded, rooting not induced.
Kalmia latifolia . .	March	15, 18	Callus formation hastened, all very slow rooting, 6 months.
Lilium Henryi (bulbs) .	March	0, 1, 2	More roots developed, thicker and shorter roots than in control plants.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Lupinus polyphyllus .	May	1, 4	Treatment caused 25 per cent. more to root.
Malus pumila (4 varieties tested) .	March	1, 2, 6	Leaf buds retarded, rooting not induced, callus formation hastened by treatments.
Pelargonium zonale (6 varieties tested) .	March	0, 1, 2, 3, 4, 5, 6, 7	Marked acceleration; roots through the stem and at base.
	September	0, 1, 2, 3, 4, 5, 6, 7	Stimulation again observed.
Phlox paniculata (roots)	August	0, 1, 2, 3, 5, 7	No leaf buds developed.
P. subulata . .	July	1, 3, 5, 7	More profuse and quicker rooting resulted.
		2, 4, 6	Tissue damaged.
		8	As controls.
Pittosporum Dallii .	March	0, 1, 6, 7	No rooting induced.
Rhododendron arboreum	April	1, 6, 7	No rooting induced.
Salix vitellina . .	April	1, 2, 3	Treatment checked buds, and caused more roots to develop.
		8	Like controls.
Senecio laxifolius .	November	12, 13, 14	No benefit resulted from treatment.
Schima argentea . .	May	0, 1, 2, 6, 7	No rooting induced, callus formation accelerated.
Solanum Capsicastrum	April	12, 13, 14	Roots developed.
		15, 16, 17, 18	Roots appeared quickly from old wood.
S. Lycopersicum . .	June	1, 2, 3, 4, 5, 6, 7	Roots rapidly formed.
		8, 9, 10	No roots formed.
	November	1, 2, 3, 4, 5, 6, 7	Roots slowly formed.
	July	12, 13, 14	Root initials formed in few days.
	November	12, 13, 14	Root initials formed slowly.
Viburnum dentatum .	March	1, 3, 5	Bud development retarded, rooting increased by 25 per cent. by (3).
Abies grandis (leaves) .	August	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	High concentration damaged tissues, rooting not induced.
Pinus Jeffreyi (leaves)	August	0, 1, 3, 5, 7	No rooting induced.
„ „ (stems)	August	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	No rooting induced, stronger pastes caused damage.

These results as a whole indicate that the paste method of application has proved disappointing. Only with readily-rooting species, such as Tomato and Pelargoniums, was repeated evidence obtained of induced root formation which was preceded by localized rapid cell division in the region of the pericycle in herbaceous material; with other readily-rooted species such as *Buddleia alternifolia* some acceleration was observed. No roots were induced from the stems of difficult plants such as Acacia and Pittosporum.

When applied to bulbs these chemicals caused more roots to develop quickly, but checked the final growth in length of the roots.

The unilateral application of the pastes may be of value for microscopical examination of the effects induced, but although the paste method has the advantage that active chemicals can be conveniently applied before severance of the cutting, little material

advantage has accrued in practice. On the whole, these methods cannot be recommended for general use.

From these tests it was seen that phenyl acetic acid was less active than indolyl acetic and naphthalene acetic acid. Iso-indolinone proved inactive. As a testing method the lanoline paste is useful for newly available chemicals.

Frequently it was observed that leaf buds were retarded in their development by these chemicals; in some cases the inhibition appeared complete, and no buds even opened partially.

As might well be expected, there was no gain by applying these substances to root cuttings such as Anchusa or Phlox.

It will be seen that several of the tests were made at seasons of the year at which propagation is not usually attempted, as in the case of *Rhododendron arboreum*; in these instances no evidence was obtained that the pastes used then were effective.

II. The Use of Solutions.

Solutions of the pure chemicals were made in distilled water. Small quantities of solvents were used to dissolve the less readily soluble substances, and the necessary amount of water then added to make the requisite dilutions. It was found convenient to keep strong solutions in the dark and make the requisite dilution immediately before use. Fresh solutions were always used for each experimental treatment. Tests of old solutions kept in the light were also made separately. The method of treatment was a very simple one, the cuttings were placed in the solutions at room temperature to a depth of 1½ inch or so in the available daylight; 80–100 mls. (= approx. 4 fluid oz.) were required for a batch of fifty cuttings. The usual period for uptake was 24 hours or 48 hours; other longer periods have also been tested. The cuttings were rinsed in tap water before transference to the frames.

The aim of the experiments to be described was to test many species of plants with several active chemicals so that some measure of the degree of applicability to practice could be gauged.

Methods.—The methods employed are listed and numbered so that ready reference to them may be made later by number.

Control Series :	0.	Cuttings placed direct in sand.
Control Series :	1.	Cuttings placed in distilled water for the same time as treated cuttings were placed in the solutions.
Treatments :		Cuttings placed in solution of β-indolyl acetic acid :
	2.	at a concentration of $\frac{1}{10000}$ for 24 hours.
	3.	,, ,, ,, ,, 48 ,,
	4.	,, ,, ,, $\frac{1}{20000}$,, 24 ,,
	5.	,, ,, ,, ,, ,, 48 ,,
	6.	,, ,, ,, $\frac{1}{30000}$,, 24 ,,
	7.	,, ,, ,, $\frac{1}{40000}$,, 24 ,,
	8.	,, ,, ,, $\frac{1}{50000}$,, 24 ,,
	9.	,, ,, ,, $\frac{1}{5000}$,, 48 ,,
	10.	,, ,, ,, $\frac{1}{5000}$,, 24 ,,
	11.	In water, 24 hours, solution $\frac{1}{10000}$ for 24 hours.
	12–20.	Similar, in solution of α-naphthalene acetic acid.

Treatments: 21. Similar, in sol. of phenyl acetic acid at $\frac{1}{10000}$ for 24 hours.
22. ,, ,, ,, ,, $\frac{5}{10000}$,, 24 ,,
23. ,, ,, ,, ,, $\frac{6}{10000}$,, 24 ,,
24. ,, isoindoline ,, $\frac{1}{10000}$,, 18 ,,
25. ,, ,, ,, $\frac{1}{10000}$,, 24 ,,
26. ,, indolyl butyric acid at $\frac{1}{100000}$ for 24 hours.
27. ,, ,, ,, ,, $\frac{1}{500000}$,, 24 ,,
28. ,, ,, ,, ,, $\frac{1}{1000000}$,, 24 ,,
29. ,, acetic acid at $\frac{1}{10000}$ for 24 hours.
30. ,, ,, ,, $\frac{1}{10000}$,, 48 ,,
31. ,, ,, ,, $\frac{1}{20000}$,, 48 ,,
32–40. Proprietary substance A used as 12–20.
42–50. ,, ,, B ,, ,, ,,
52–60. ,, ,, C ,, ,, ,,
62–70. ,, ,, D ,, ,, ,,
72–80. ,, ,, E ,, ,, ,,
41, 51, 61, and 71—prolonged treatments for 12, 24, 36, 48 days, as 4.

It will be convenient to give first the results with species with which the skilled propagator usually experiences little or no difficulty, and to see whether any substantial advantage is gained as the result of the treatments tested. This classification of species is purely arbitrary, but is based on local experience.

Unless otherwise indicated, the cuttings were the usual stem cuttings. Fifty cuttings were used in each batch.

1. *RESULTS WITH READILY PROPAGATED PLANTS.*

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Anthemis Sancti-Johannis (flower stalk with "heels")	July	1, 17	Treatments caused 65 per cent. more cuttings to root in 8 days, and many more roots on each cutting.
Azalea indica (3 vars.)	August	1, 2, 12, 3, 13	Treatments caused 30 per cent. more to root in 3 months.
Buddleia alternifolia (young wood)	July	0, 1, 2, 4, 5, 12, 14, 15, 42, 44, 45, 62, 64, 65	Treatments caused acceleration of rooting, more roots on cuttings and 60 per cent. more cuttings to root in 14 days.
Buddleia alternifolia (old wood)	July	0, 1, 2, 4, 5, 12, 14, 15, 52, 54, 55, 72, 74, 75	Results even more favourable, very rapid rooting induced.
Buddleia alternifolia (*a*) young; (*b*) old wood	August	1, 2, 4, 11	Water treatment first no advantage, but no detriment if followed by 2.
Buddleia alternifolia (*a*) young; (*b*) old wood	August	0, 1, 2, 11, 42, 62	Treatments satisfactory if concentration suitable.
Ceanothus dentatus .	November	1, 8, 22, 25	Treatment 8 caused 46 per cent. more cuttings to root in 7 weeks. Rapid cell division. 22 and 25 ineffective.
Clethra alnifolia . .	March	1, 15, 30	No material advantage gained with leafless cuttings.
Daphne Laureola . .	November	1, 2, 22	Treatment 2 caused 30 per cent. more cuttings to root in 5 weeks, and more roots; 22 ineffective.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Delphinium hybrids .	March	1, 2, 12, 62	Treatments caused 25 per cent. more cuttings to root in 14 days, more roots and acceleration.
Deutzia scabra . .	July	1, 2, 4, 12, 14	Treatments caused 20 per cent. more cuttings to root in 3 weeks, more roots and acceleration.
Diervilla florida . .	July	1, 2, 12	Treatments gave results as above. Cuttings " grew on " well.
Dianthus Caryophyllus (perpetual var.)	October	0, 1, 7, 17, 27	7 and 17 treatments caused 30 per cent. more cuttings to root, 27 caused 50 per cent. more to root in 2 weeks; all grew on well.
Erica arborea alpina .	September	1, 12	Treatment gave results as above.
Erica australis . .	September	1, 12	Little advantage by treatment.
Erica caffra . .	December	1, 2, 21, 24	Slight advantage from treatments.
Erica melanthera .	December	1, 2, 12, 42	Treatment 2 caused 20 per cent., treatments 12 and 42 caused 72 per cent. more cuttings to root in 8 weeks. Profuse root development.
Erica multicaulis .	September	1, 2, 12, 52	Slight advantage from treatments.
	October	1, 7, 17, 26	Similar result obtained.
Erica vagans hevernensis	September	1, 2, 12, 62	All treatments caused 20 per cent. more cuttings to root. More roots and acceleration.
Erica Watsonii . .	September	1, 2, 12, 72	Treatment 12 caused 50 per cent. more cuttings to root in 8 weeks. *
Erinacea pungens .	December	1, 8	No advantage from treatments.
Escallonia × *langleyensis*	July	1, 10, 20	Solutions too strong.
	July	1, 2, 12	Treatments caused 50 per cent. more cuttings to root. More roots and acceleration.
	July	1, 2, 12, 51	Treatments advantageous, but no special gain by prolonged treatment 51.
Forsythia suspensa .	June	1, 2, 12	Accelerated root development by treatments.
Fuchsia macrostemma (6 varieties separately)	September	0, 1, 7, 17, 27	Treatments caused 80 per cent. more cuttings to root in 3 weeks. Profuse root development. Grew on well.
	September	0, 1, 7, 17	Treatments caused 25 per cent. more cuttings to root. Acceleration also.
Gentiana sino-ornata .	October	1, 2, 22	Solutions too strong. 2 accelerated root development, 30 per cent. more cuttings rooted in 4 weeks. 22 inefficient.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Grevillea sulphurea .	October	1, 8, 18, 22	Treatment 8 caused 10 per cent more cuttings to root. Others showed slight advantage.
Griselinia litoralis .	May	1, 5	Slight advantage from treatment.
Gypsophila paniculata (Rosenchliers)	July	1, 7, 26	All rooted 100 per cent. in 10 days.
Hedera Helix (bush form) (fig. 50)	January	1, 2, 12	Treatments caused 100 per cent. to root in 4 weeks. Controls 0.
Hydrangea hortensis .	October	1, 4	Treatments caused 10 per cent. more cuttings to root, acceleration and more profuse root system.
Kerria japonica . .	July	1, 6, 16, 46, 56	All rooted well. Some acceleration by treatment 6.
Lithospermum prostratum	January	1, 3, 13	Treatments caused 20 per cent. more cuttings to root in 4 weeks, more roots formed.
Lupinus polyphyllus .	May	1, 6, 7	Very little advantage, some acceleration.
Lonicera yunnanensis .	December	0, 1, 4, 44	Treatments caused 40 per cent. more cuttings to root in 3 weeks.
	January	0, 1, 14, 54	Treatments caused 65 per cent. more cuttings to root in 4 weeks.
Myrtus communis tarentina	October	0, 1, 2, 12, 22	Treatments 2 and 12 caused 100 per cent.; 22 caused 20 per cent. cuttings to root. Controls 0 in 4 weeks.
	January	0, 1, 2, 8, 18	Stronger treatments, highly successful.
	March	0, 1, 5, 15, 45, 55	Results as in October. Marked stimulation.
Olearia nummularifolia	October	1, 2, 12, 42, 52, 62	All treatments caused from 60–80 per cent. more cuttings to root rapidly.
Osmanthus Aquifolium .	October	1, 8	Treatments caused 50 per cent. more cuttings to root, more roots, marked acceleration.
Pelargonium zonale (10 varieties)	September	1, 2	Treatments caused rapid formation of roots on all varieties tested.
Prunus incisa . .	September	1, 4, 14	Treatments caused 40 per cent. more cuttings to root in 3 weeks.
Rhododendron obtusum 'Apple Blossom'	March	1, 2, 3, 12, 13	Treatments 12 and 13 caused 40 per cent. more cuttings to root in 5 weeks, 2 and 3 25 per cent. more than controls.
Ribes Grossularia (3 varieties)	October	1, 14	Treatment caused more rapid rooting, and 20 per cent. more cuttings to root.
Senecio laxifolius . (fig. 52)	November	1, 12, 15	Rooting accelerated. Treatments caused 50 per cent. more than controls to root.

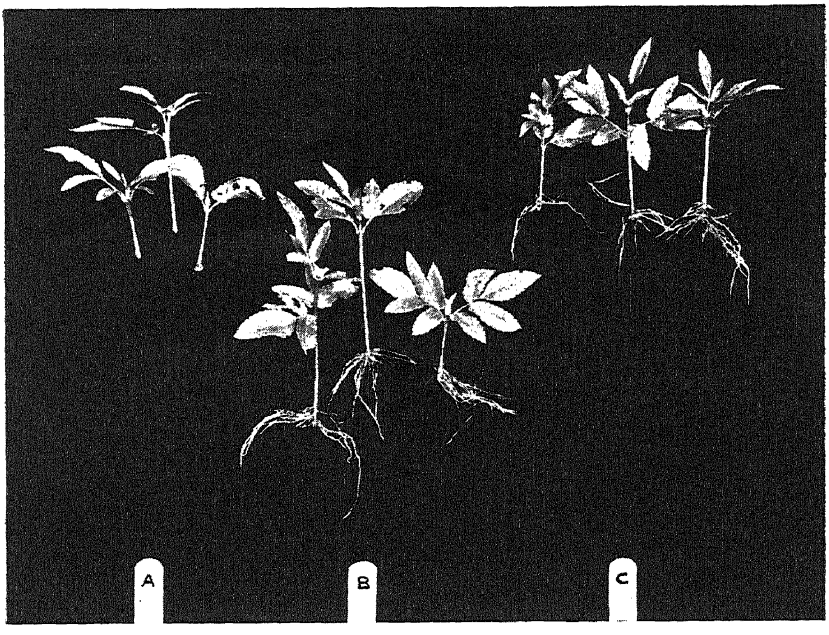


FIG. 49.—CUTTINGS OF EUCRYPHIA GLUTINOSA TREATED IN JULY.
(A) Controls. (B) Naphthalene acetic acid $\frac{1}{80000}$ for 24 hrs. (C) Indolyl butyric acid $\frac{1}{80000}$ for 24 hrs. Photographed 8 weeks later.

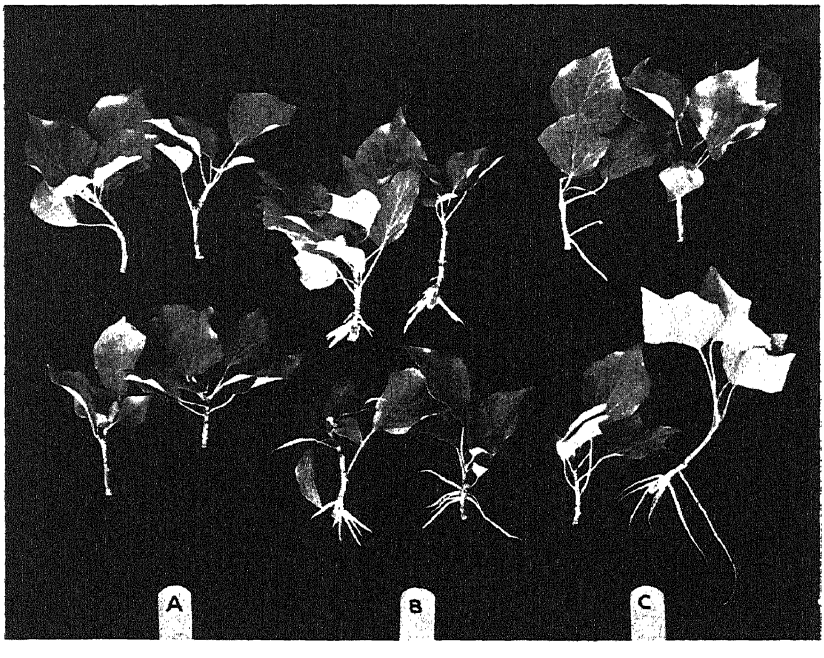


FIG. 50.—CUTTINGS OF TREE IVIES TREATED IN JANUARY.
(A) Controls. (B) Indolyl acetic acid $\frac{1}{100000}$ for 24 hrs. (C) Naphthalene acetic acid $\frac{1}{100000}$ for 24 hrs. Photographed 3 weeks later.

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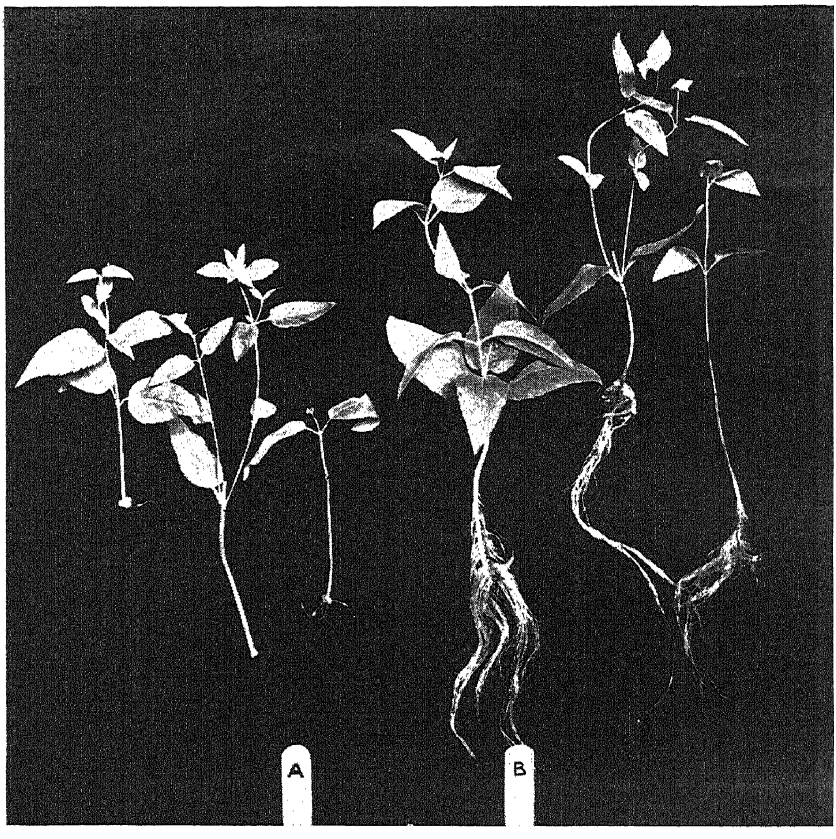


FIG. 51.—CUTTINGS OF MONARDA CITRIODORA TREATED IN JULY.
(A) Controls. (B) Naphthalene acetic acid $\frac{1}{40000}$ for 24 hrs.
Photographed 4 weeks later.

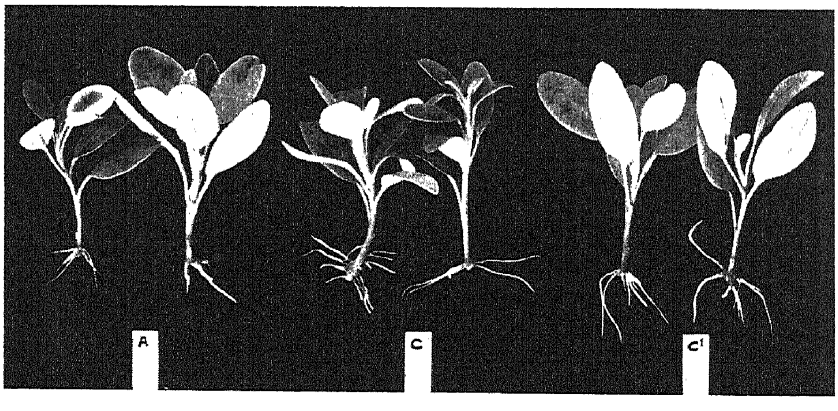


FIG. 52.—CUTTINGS OF SENECIO LAXIFOLIUS TREATED IN NOVEMBER.
(A) Controls. (C) Indolyl acetic acid $\frac{1}{10000}$ for 24 hrs. (C') Old solution exposed to light of indolyl acetic acid $\frac{1}{10000}$ for 24 hrs. Photographed 3 weeks later.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Skimmia japonica (both sexes)	July	1, 6, 16, 26, 66	Treatment 16 caused 45 per cent. more to root in 4 weeks. 26 caused 15 per cent. more to root in 4 weeks. Acceleration noticed.
Tricuspidaria dependens	January	0, 1, 2, 14	Treatments caused 60, 55, and 50 per cent. more cuttings to root. Rapid cell division noticed.
	March	0, 1, 15, 29, 30, 31	Acetic acid ineffective. Others as above.
Viola cornuta . .	July	1, 7, 17, 28	All treatments caused 30 per cent. more cuttings to root in 2 weeks.

In fifty plants of the above series the treatments proved definitely advantageous. In none did the untreated cuttings show to advantage over the treated when the proper dilution of the solutions was used, but strong solutions caused damage.

The beneficial effects of the treatments were :

(*a*) a higher percentage of the cuttings rooted ;
(*b*) more profuse root systems with a greater number of roots developed from the cuttings ;
(*c*) the rooting process was accelerated.

The gain in horticultural practice consisted largely in facilitating and accelerating the process of propagation which occurs more slowly with less certainty without the treatment.

The gain was confined almost entirely to leafy cuttings ; leafless cuttings from deciduous shrubs in winter showed little or no response. The method is therefore of value to assist the normal routine practice of seasonal propagation in summer.

Many plants, numbering several hundreds, have been raised from these rooted cuttings, and no ill after-effects have been discerned. Where rapid rooting took place it was necessary to carry out the transference to the small pots containing suitable compost earlier than in the control series. If the transference was delayed the danger of damaging the root systems was increased, and this point is one that demands a little attention from practical men long accustomed to carry out the transference at a fixed interval of time gauged by previous experience.

Frequently root formation was not limited to the end of the cutting, and rows of roots developed on the stem extending for a distance of approximately 1½ to 2½ inches. If cuttings remain for long periods in the weak solutions, roots may be formed further up the stem, and in certain instances such as *Buddleia alternifolia*, Escallonia hybrids, and other plants the roots may emerge from amongst the leaves. Experience has shown that it is possible to divide such cuttings into two halves, and that both may grow into satisfactory plants.

In very many instances the first sign of stimulation was seen as a swelling of the basal part of the cutting caused by active growth of

certain tissues inside. The roots emerged shortly afterwards. No case was observed in which such swelling was not followed by the development of roots.

A consideration of the chemicals and their useful concentrations and the time necessary for the uptake of the solutions is deferred to a later section of this report.

2. *RESULTS WITH LESS READILY PROPAGATED PLANTS.*

The second group of results to be considered was obtained from plants offering at least some difficulty to propagators; many of the cuttings of such plants may not usually form roots; or the process may be inconveniently slow.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Acer circinatum . .	July	1, 16	No rooting resulted.
Acer laxiflorum . .	July	1, 16	No rooting resulted.
Anthyllis Hermanniae .	October	1, 2, 12, 42	Treatments caused 20 per cent. more cuttings to root in 4 weeks.
Arbutus Unedo rubra .	January	1, 2	No rooting resulted.
Atraphaxis buxifolia .	July	1, 16	No rooting resulted.
Berberis Darwinii .	October	1, 2, 12, 23	Little advantage from treatments 2 and 12. 23 too strong.
Camellia japonica .	July	1, 2, 12	More rapid rooting and higher (40 per cent.) by treatments. Plants grew well later.
,, ,,	September	1, 2, 12	Results as last.
,, ,,	November	1, 2, 12, 52	,, ,,
Corylopsis Willmottiae (young wood)	July	1, 14, 26	Treatment 26 caused 61 per cent. more cuttings to root, 14 caused 30 per cent. more to root in 6 weeks. More profuse root systems. Plants grew very well.
Cydonia japonica alpina	September	1, 15, 26	Treatment 26 caused 70 per cent. more cuttings to root, 15 caused 10 per cent. more.
Enkianthus perulatus (young wood)	July	1, 16, 26	Treatment 26 caused 30 per cent. more cuttings to root; 16 gave 10 per cent. more in 7 weeks.
(older wood)	July	1, 16, 26	Treatment 26 caused 40 per cent. more cuttings to root, 16 caused 10 per cent. more.
Eucryphia glutinosa . (fig. 49)	July	1, 16, 26	Treatment 26 caused 55 per cent. more cuttings to root. Treatment 16 caused 35 per cent. more. Profuse root systems induced. Plants grew well.
Feijoa Sellowiana .	January	1, 2, 14	No rooting resulted.
Gaultheria procumbens (young wood)	March	1, 2, 12	Treatment 2 caused 35 per cent. more cuttings to root, 12 caused 51 per cent. more.
Gentiana Farreri .	October	1, 2	Unsatisfactory

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Hydrangea petiolaris .	July	1, 2, 12, 62	Treatments caused 60 per cent. more cuttings to root in 6 weeks.
Hymenanthera crassifolia	October	1, 4, 14	Treatments caused 50 per cent. more to root in 3 weeks.
Ilex Aquifolium . .	June	1, 2, 12, 42, 52	Results as last.
	July	12, 42, 72	Results as last.
	August	1, 2, 52, 62	Results as last.
Ilex Fargesii . .	December	1, 2, 8	No rooting induced.
Lupinus albifrons Douglasii	October	1, 17, 26	Treatments caused 25 per cent. more cuttings to root in 3 weeks.
Monarda citriodora . (fig. 51)	July	1, 17, 47, 57	Treatments caused 60 per cent. more cuttings to root in 3 weeks.
Pelargonium crispum .	December	1, 2, 21, 24	Treatments caused 15 per cent. more cuttings to root.
Pernettya mucronata (young wood)	October	1, 2, 12, 62, 72	Treatment 2 caused 60 per cent. more cuttings to root; 12 too strong.
(old wood) (nodal)	October	1, 10, 20	Improved rooting.
(young wood)	February	1, 2, 12	No rooting induced.
(old wood) (nodal)	February	1, 4, 12	Slow rooting induced.
Phlox subulata 'Lavinia'	June	1, 4, 14, 44, 54, 64	Treatment 4 caused 20 per cent. more cuttings to root in 2 weeks; 14 equalled control.
Pieris formosa . . (fig. 53)	August, 1936	1, 2, 12	Treatments caused 20 per cent. more cuttings to root in 5 weeks. Acceleration over control.
	August, 1937	1, 2, 12, 42, 52	Results as last.
Rhododendron discolor .	August	1, 3, 13	Equalled control, very slow rooting.
R. neriiflorum . .	March	1, 5	Results as last.
R. rubiginosum . . (fig. 54)	March	1, 5, 15	Treatment 15 caused 75 per cent. more cuttings to root, 5 caused 20 per cent. more. Profuse root systems formed.
Rosa altaica . .	September	1, 2, 14, 26	Treatments induced slow root formation. Partial success.
R. oxyodon . .	September	1, 2, 14, 26	Results as last.
R. spinosissima . .	September	1, 5, 15, 26	Slight gain by treatments.
R. Willmottiae . .	September	1, 5, 15, 26	Treatment 5 caused 20 per cent. more cuttings to root in 15 days, and 30 per cent. more cuttings to root finally.
Schima argentea . .	January	1, 2, 14	Treatment 2 caused 30 per cent. more cuttings to root very slowly.
	July	1, 14, 26	Very slow rooting.
Viburnum Carlesii .	July	1, 2, 12, 42	All treatments caused 100 per cent. cuttings to root in 3 weeks. Without treatment, none.
V. rhytidophyllum (bud cuttings)	August	1, 2, 12, 52	Roots developed, but buds inhibited; no plants raised.

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Taxus baccata . .	July	0, 1, 6, 16	Treatment 16 caused 60 per cent. more cuttings to root in 6 weeks.
	December	0, 1, 5, 15	Very slow rooting.
Thuja dolabrata . .	July	0, 1, 4, 14, 44, 54	Treatments caused 45 per cent. more cuttings to root in 3 months. Controls very slow.

This group of plants contained only a few herbs. Forty-seven tests are reported; in none did the treatments of stem cuttings prove deleterious, and in none did the controls root in a more satisfactory manner than did those treated. In thirty-two tests (70 per cent.) the treatments gave advantageous results by causing a higher percentage of the cuttings to root. Some acceleration of the rooting was again noticed, together with a more copious development of roots.

The proportion of successful experiments was approximately equal in summer and winter, but the number of the winter tests was small. Again little or no success was obtained with leafless cuttings.

The gain in practice consisted of the increased number of rooted cuttings obtained in a shorter time. Many of the plants so raised have been permitted to grow and have proved successful. No ill after-effects have been seen with stem cuttings; bud cuttings (a leaf blade, petiole, bud and a small piece of stem) have not grown and developed into good plants though many roots were induced.

As before an early sign of stimulation was seen in the swelling of the lower part of the stems followed by the splitting of the bark as with *Ilex Aquifolium* and *Viburnum Carlesii*.

3. *PLANTS DIFFICULT TO PROPAGATE BY CUTTINGS.*

Lastly experiments have been made with thirty species known to be difficult. It has not been possible to test many of these at all seasons of the year, with many types of cuttings. As the plants are difficult to propagate and are consequently somewhat scarce, large quantities of material have not been available, and this has sometimes prevented duplication and repetition of the experiments.

(*a*) *Favourable Results.*

Species.	*Date.*	*Treatments.*	*Results and Notes.*
Acer rufinerve albo-limbatum	October	1, 14	Treatments caused 12 per cent. to root.
Chimonanthus fragrans	October	1, 3, 13, 15	Treatment 3 caused 210 per cent. to root. Controls did not root.
Kalmia latifolia myrtifolia	January	0, 1, 3, 13	66 per cent. rooted slowly as result of treatment. 12 per cent. rooted in control series in 5 months.
Pittosporum Dallii .	August	1, 2	10 per cent. of treated cuttings rooted.
Polygonum paniculatum	July	1, 16, 26	0 controls rooted; 10 per cent. treated cuttings rooted.

(*b*) *Inconclusive Results.*—In these experiments, with the exception of *Pittosporum tenuifolium*, in which a few untreated cuttings rooted, no rooting took place in either control or treated series; the treatments employed did not induce root formation at the stated season of the year.

Species.	*Date.*	*Treatments.*
Acacia alata . .	July	0, 1, 2, 12, 52
Acacia dealbata (young wood)	July	0, 1, 2, 12, 42
Acacia longifolia mucronata	June	0, 1, 16
Aegle Sepiaria . .	October	0, 1, 2, 23, 62
Arundinaria Murielae .	October	1, 2
Aspargus officinalis (shoots)	April, May, August, September, October	0, 2, 3, 12, 13, 26, 53, 43, 63
(older shoots)	,,	1, 2, 12, 23, 43, 53
(ultimate branches)	,,	1, 2, 25, 23, 43, 63
(roots)	,,	1, 2, 22, 23, 53
Ebenus cretica . .	July	1, 7, 17
Eucommia ulmoides .	July	1, 2, 12
Kalmia latifolia . .	March	1, 5, 15, 45
Malus baccata Jackii .	July	1, 14, 26
Malus pumila (4 difficult scion vars.)	February	1, 12, 14
(2 difficult scion vars.)	July	1, 3, 14, 26
Malus Sargentii . .	July	1, 6, 16
Mutisia subulata .	November	1, 2, 12, 52
Pittosporum tenuifolium	August	1, 2, 12
	January	1, 2, 12
Abies grandis (leaves) .	August	1, 2, 12, 52
Pinus Jeffreyi . .	August	1, 2, 12, 42
(leaves) .	August	1, 2, 12, 42
Plagianthus Lyallii .	July	1, 17, 26
Rhododendron arboreum	July	1, 2, 12, 42
R. ponticum . .	September	1, 2, 12, 52
R. Thomsonii . .	August	1, 2, 12, 62
Sciadopitys verticillata (leaves)	September	1, 2, 12, 42

Only five species known to be difficult to propagate have given positive results showing the treatments to advantage. The list of inconclusive results includes species that may require testing many times during the year. Other species such as *Asparagus officinalis* do not appear to have any tissue capable of ready response by cell division. Few monocotyledonous plants have been tested so far.

The gain in practice is as yet limited to the few responsive species shown, and much further work is required at different seasons with various types of cuttings.

Abnormal Cases.—The number of cases in which the controls did better than treated plants was few; of these two were root cuttings—Phlox and Anchusa. As the chemicals are root-forming substances it was, of course, unlikely that they would stimulate the development of leaf buds on root cuttings. The other case was a " bud " cutting,

Viburnum rhytidophyllum, where roots developed freely; but as the bud was in close contact with the solution it did not develop.

After Effects.—Many plants have been grown on successfully for six to eight months after treatment, including Holly, Ivy, Camellias, Corylopsis, Pernettyas, Fuchsias, Schima, *Rhododendron rubiginosum*, *Pieris formosa*, *Taxus baccata*, *Thuja dolabrata*, *Hydrangea petiolaris*, *Ribes Grossularia*; no ill effects have been discerned. Due care has been taken not to injure long roots nor to transfer rooted cuttings suddenly from the moist atmosphere of a closed frame to the drier air of a large cool house. When these precautions were taken the treatment caused the earlier growth to be appreciable some six to eight months later.

Anatomical Details.

(*a*) *Herbaceous material.*—Small quantities of indolyl acetic acid (approximately 0·0005 gm.) have evoked rapid changes in the tissues of tomato. Sixty-five hours after application Professor F. E. Weiss observed that many epidermal, cortical and pith cells were twice the size of comparable control cells. In many cells radial walls developed in the epidermis, hypodermis and cortex. Cell division took place in vacuolated and apparently mature cells of the tissues even in differentiated tissue such as the collenchyma. Frequently this division was repeated several times to form a row of new cells pushing apart older cells but showing signs of constraint. Meristematic activity was induced in the region of the pericycle; where secondary thickening had completed a ring of phloem and xylem, leaving no primary rays, the inner cells of the phloem frequently responded. Root initials developed from the pericycle or from the phloem cells.

The starch sheath diminished as the cell division increased. Lignification and differentiation of the new tissues did not keep pace with the induced cell division, so that at the earlier stages the newly formed tissue was parenchymatous.

(*b*) *Woody material.*—In some woody cuttings, such as Willows and certain varieties of Apples, root initials are already formed. In the Apple, "burrs" or root initials may be apparent on the exterior tissues; such varieties have always been known to root readily. Other varieties without these primordia visible externally or internally will not root readily. It might therefore be thought that species rooting readily all possessed latent root initials or groups of cells that may so function. Whether this is so remains somewhat doubtful. There is reason to believe that some at least of the responsive species do not possess such structures; e.g. *Eucryphia glutinosa*.

The details have been observed with certain species such as *Myrtus communis*, *Ceanothus dentatus* and *Tricuspidaria dependens*. The rapid cell division is not accompanied by cell differentiation, a much slower process, so that parenchymatous tissues result. Thus an "internal callus" is formed. This is pressed outwards and frequently

breaks the bark or outer layers and may emerge in certain species as irregular plastic excrescences (e.g. *Tricuspidaria dependens*). The relationship of the branching vascular tissue moulds the shape of such excrescences aided by the continued pressure from behind; a cylindrical structure results. With certain species, such as *Myrtus communis* the stimulated areas seen in a transverse section are not clearly defined patches. The central conducting zone may be entirely surrounded by a new wide layer of some twenty or more cells in radial thickness. In *Ceanothus dentatus* some slight differentiation was observed in the new tissue; the medullary rays were continuous with those present before treatment. Regular cell division in the form of abscission, as from a normal cambial layer, does not always take place; some intercalary growth is possible, as a few cells may divide several times. The new tissue lies in a position of secondary phloem, but does not resemble phloem in structure. In control cuttings this rapid cell division is not seen. At the very base of the cutting a few cells divide and an external callus is formed. In the stimulated cuttings cell division is usually confined to the lower part of the stems, but in a few instances it may also occur higher up the stem. In such cases roots may emerge amongst the leaves.

In the control cuttings the naturally produced hormone accumulates at the base of the cutting; in the treated cuttings the uptake of the growth substances is effective in causing cell divisions in a fairly long zone frequently of 1–3 cms.

In a monocotyledon such as the Asparagus it seems unlikely that there is any suitable tissue capable of response to these substances. With the difficult-rooting species only further detailed anatomical evidence will reveal whether this is an applicable explanation, or whether the chemical has yet to be tried that will evoke a response from awaiting tissues at the suitable season.

Concentration and Time of Uptake.

Damage to the tissues caused by the use of solutions of too high a concentration was soon noticed. Black zones of tissue in the region of the conducting tissues quickly develop in herbaceous tissue; if the strong solutions reach the buds the tender leaves are damaged; they frequently also show black discoloration. In woody cuttings the use of solutions of too great a concentration also caused damage. The outer tissues of the stem actually placed in the liquid soon showed signs of injury when the cuttings were subsequently placed in the frames. Occasionally the removal of the basal inch of the damaged cutting permitted successful propagation. The leaves may fall from the stems injured by strong solutions; such cuttings have not rooted. The apical bud may also be injured and show damage by discoloration. Experience has shown that a further dilution by adding three times as much water, to make a quarter of the previous concentration, is

a quick practical step tending to overcome this difficulty and to permit of further tests likely to prove successful.

The dilutions recommended by the manufacturers of proprietary solutions have generally proved satisfactory in our tests.

For herbaceous material very dilute solutions are effective. One part in forty thousand of naphthalene acetic and indolyl acetic are useful concentrations; one part in sixty thousand of indolyl butyric has proved advantageous.

For woody material one part in twenty thousand of naphthalene and indolyl acetic is usually sufficient, but by using one part in ten thousand many successes have been obtained.

At room temperature with the available daylight 24 hours or 48 hours appears to be sufficiently long for most species. No advantage has been obtained with, for example, Escallonias, by allowing the cuttings to remain for a prolonged period of several weeks in the solution. With certain species rooting was induced further up the stem and the cuttings were successfully divided into two parts, both of which grew on satisfactorily. (In dull winter weather the longer period of 48 hours is recommended, as transpiration is slow.)

Buddleia alternifolia has proved a very useful test species, and using this plant it has been found that twice the length of time for uptake from a solution half as concentrated is not as effective as the stronger solution for the given time. This and other tests not reported here indicate an effective concentration below which no stimulation occurs.

Various Methods of Application.

A few tests have been made with other methods of application of the chemicals to the cuttings.

(*a*) *Spraying.*—Cuttings placed in the frame were sprayed with the solutions. Using *Arbutus Unedo* and indolyl acetic $\frac{1}{10000}$ in November no successful rooting was induced by spraying three times at intervals of two days. The leaves showed signs of injury and many fell from the stems. A test with *Eucalyptus coccifera* using indolyl acetic $\frac{1}{10000}$ was made in December and only resulted in injury to the leaves. Although the concentrations used were strong, on the alternate days the routine spraying with water tended to wash away any unabsorbed solution.

(*b*) *Uptake by leaves from solution.*—Using *Myrtus communis*, known to respond readily, cuttings have been placed with their leaves in the solutions after exposing the cuttings to the drying effect of the atmosphere from the time of severance for 12 hours. The leaves were placed in the solution of indolyl acetic and naphthalene acetic acid and proprietary solution for 48 hours at a concentration of $\frac{1}{20000}$. The method was not satisfactory, whereas immediate stimulation resulted from treatment of the stems. Thus the movement of any chemicals taken up was not sufficiently rapid in a down-

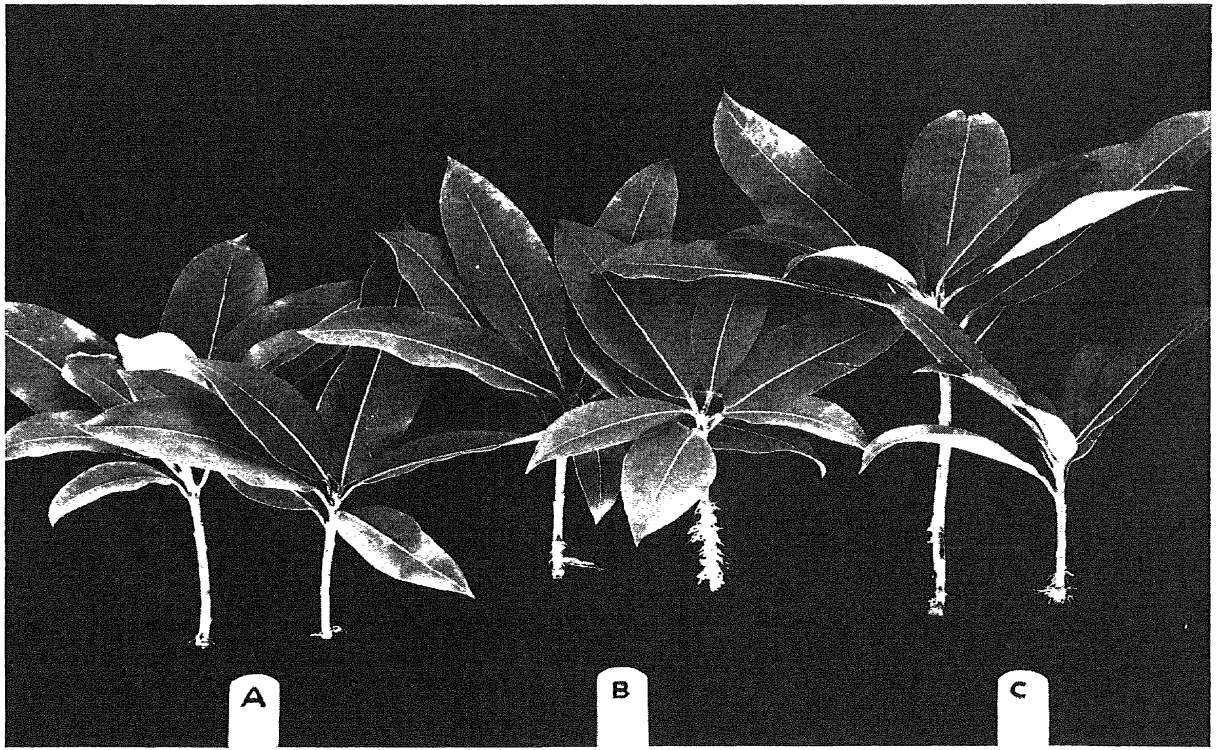


FIG. 53.—CUTTINGS OF PIERIS FORMOSA TREATED IN AUGUST.
(A) Control. (B) Naphthalene acetic acid $\frac{1}{10000}$ for 24 hrs. (C) Indolyl acetic acid $\frac{1}{10000}$ for 24 hrs. Photographed 9 weeks later.

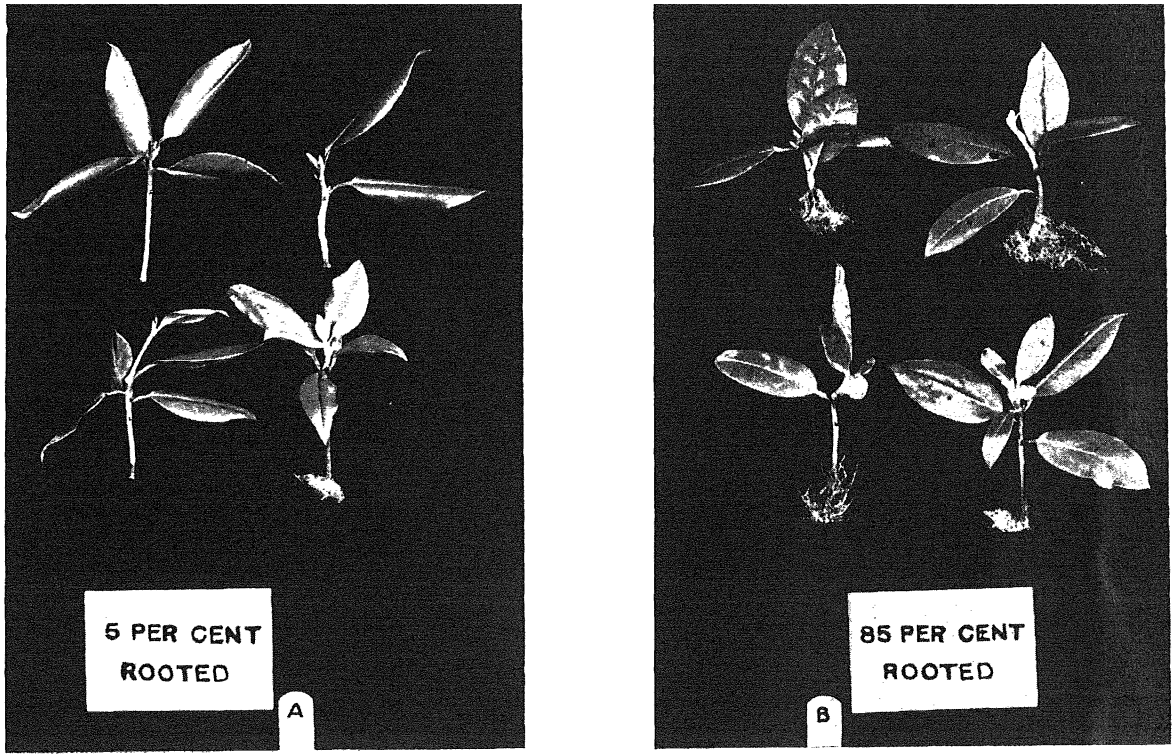


FIG. 54.—CUTTINGS OF RHODODENDRON RUBIGINOSUM TREATED IN MARCH.
(A) Controls. (B) Naphthalene acetic acid $\frac{1}{20000}$ for 48 hrs. Photographed 3 months later.

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ward direction to induce rooting at the base of the cutting; roots did not develop elsewhere.

(*c*) *Treatment of the rooting medium.*—Successful stimulation to root formation can be brought about by pouring the solution on to the sand, but it is not possible to investigate the concentrations to which the cuttings are exposed. The use of an organic material such as peat to retain the chemical, whilst of practical value, does not permit the accurate determination of the indolyl compounds, for it is possible and probable that the peat itself contains similar products, derived from protein breakdown, which may be active. For this reason pure sand is preferable for experimental purposes. The sand requires to be renewed to prevent any possibility of contamination; such contamination from the cuttings may be a possible explanation of the suggestion put forward by propagators that old sand is sometimes better than new!

(*d*) *Injection.*—Injection proved to be an inconvenient method when previously tested with chemicals and hormones, especially with herbaceous tissues into which measured quantities of liquid cannot readily be injected. There is always some loss by exudation. When many cuttings have to be taken it may prove to be practicable to inject a lower branch before severance of the cuttings.

(*e*) *Pastes.*—The further tests made with pastes as against solutions show the paste method unsuitable for garden routine. It has certain advantages for investigations, where its unilateral application may be of value for microscopical examination of the effects induced. The paste method has one advantage in that the pastes can be applied before severance of a cutting, but at Wisley so far but little advantage has resulted by such treatments. For application to fruits or developing fruits the paste method is convenient.

The most reliable method tested so far and also the one likely to prove most efficient in the hands of the busy propagator has been the simple use of solutions into which the cuttings have been placed at room or greenhouse temperature in daylight.

Treatments and Season.

For nursery work and other propagation carried out on a large scale, herbaceous plants are conveniently propagated in early spring from mid-February to early April, whilst cuttings of many shrubs are taken from June to September. If the treatments discussed in this report are to prove convenient and adaptable to the seasonal procedure of such gardens, they must be successful at the indicated seasons.

The time of year at which cuttings are taken from many plants is well known to influence the success or failure obtained. In these tests it has been possible as yet only to sample cuttings throughout the year from a few species. The wide selection of species used has permitted the inclusion of cuttings of plants which root without treatment at different seasons of the year.

The seasonal distribution of the selected species and varieties can be seen in the table which shows the numbers tested at each season. The success obtained with treatments is also shown.

A successful test is one in which 66 per cent. or more of the batch of cuttings produced roots at least ¼ inch long in three weeks in the sand. Figures below this standard have been considered for our immediate purpose as unsuccessful or failures. The table is made from tests of plants treated by solutions only. The seasonal dates are based on experience of local conditions and are arbitrary.

Table showing the seasonal distribution of natural successful propagation, and stimulation by solutions to facilitate propagation.

Season.	*Kind.*	*No. of Species tested.*	*Successful and Rapid Propagation. (As defined.)*		*Difference in No. of Species.*
			Control.	*Treated.*	
Winter	Herbs.	3	1	2	1
14/XI–14/III	Shrubs.	30	2	17	15
Spring	Herbs.	3	1	2	1
14/III–1/VI	Shrubs.	4	1	2	1
Summer	Herbs.	6	1	5	4
1/VI–14/IX	Shrubs.	56	12	38	26
Autumn	Herbs.	4	1	3	2
14/IX–14/XI	Shrubs.	34	7	25	18
Total in Year . . .		140	26	94	68

From this table it is seen that only two of the thirty species of shrubs tested were readily and, as previously defined, "successfully" propagated in winter without the aid of treatments which resulted in facilitating the rooting of the cuttings of a further fifteen species (half the number tested) so that success was obtained. Similarly in summer, of the fifty-six species tested only the cuttings of twelve rooted in large enough numbers and in a short enough time to be termed successful; as the result of the treatments a further twenty-six species were classified as successful. In autumn, of the thirty-four species tested the cuttings of only seven species rooted quickly in large numbers, but as the result of the treatments a further eighteen species were classified as successes.

It is seen that improved rooting is not confined to any one season.

In general, a further 50 per cent. of the number of species tested can be propagated successfully as the result of the treatments. This does not define the entire advantages of the treatments, for less striking responses have been obtained with many other species which, however, did not attain the necessary level of performance demanded by this classification.

Similar results have been obtained with herbaceous plants, though the smaller numbers tested do not permit of such generalizations.

CONSIDERATION OF AVAILABLE CHEMICALS.

Instability in light.—Solutions of indolyl acetic acid, and indolyl butyric acid, if exposed to daylight, become brown and precipitation occurs; when tested such solutions are less effective. α-naphthalene acetic acid also undergoes change, though rather more slowly; the solution may gradually develop a brownish-purple tint. Such solutions lose their efficiency.

Stronger solutions kept in coloured glass bottles or opaque vessels have kept for a year with little or no apparent loss of efficiency.

Solvents for the dry chemicals.—Ethyl alcohol, used at 75 per cent. or 50 per cent., is useful for dissolving indolyl acetic, butyric, and naphthalene acetic acid. If 0·4 gm. of the dry growth-substances be taken and dissolved in less than 8 c.cs. of alcohol, additional water to 1 litre gives a solution of four parts in ten thousand of the growth substance which keeps fairly well in the dark and permits subsequent dilution. The naphthalene acetic acid may require a period of 48 hours after adding the water, with intermittent shaking, to ensure a satisfactory solution. The alcohol on ultimate dilution will be less than $\frac{1}{1000}$. Acetone may be used similarly, with no ill effects at the ultimate dilution of one part in 1,000 or less.

Other useful solvents are ethylene-glycol-mono-ethyl ether and ethylene-glycol-mono-methyl ether, used in a similar manner to the alcohol. At ultimate dilutions of one part in a thousand of water no damage to the plant tissues has been detected; even at one part in five hundred there was little damage when these substances were tested alone in water.

When used to dissolve indolyl acetic to make $\frac{1}{2000}$ and $\frac{1}{4000}$ solutions, at a rate of one part per thousand or one part per two thousand ethylene-glycol-mono-ethyl ether was also satisfactory.

(*a*) *Phenyl acetic acid.*—Generally the tests made with this acid have proved that it is not sufficiently active to recommend for general use in solution for a wide range of species. The successful trials and acceleration of rooting over controls amounted to 15 per cent. of the species tried; the failures were 43 per cent. where the controls rooted better than or as well as the treated series.

(*b*) *α-naphthalene acetic acid.*—This compound has the advantage that it is readily obtainable and at a fairly reasonable price. It has the disadvantage of being more difficult to dissolve. There can be no question of its highly active nature in causing rapid cell division and root formation. It ranks high in the list of useful substances. It has given satisfactory results with a wide range of species, including more than 40 per cent. of plants known to be somewhat difficult to propagate, and has been successful in causing better root formation than control series in 52 per cent. of the species tested.

(*c*) β-*Indolyl acetic acid.*—Indolyl acetic acid was amongst the first substances to be extensively tested at Wisley. As hetero-auxin it was one of the first active substances to be isolated from urine and tested.

It has given satisfactory results with a wide range of species, including more than 40 per cent. of plants known to be somewhat difficult to propagate, and has been successful in causing better rooting than control series in 56 per cent. of the tested species.

The very close approximation of this figure with that obtained with naphthalene acetic and indolyl butyric shows the chemicals to be of almost equal activity in this respect. The similarity of the figures is largely due to the use of many of the same species in each case, some species failing to respond to all acids and others responding to all. There was no real significant evidence of selective activity, *i.e.* of many plants responding to one and not to the other growth substance. The difference between the response of various species was a more important factor than that between the activity of the three chemicals.

(*d*) *Indolyl butyric acid.*—The tests made with this acid show it to be very highly active. Used in solution at a great dilution of one part in 50,000 of water or one in 60,000 it has proved effective. The range of species tested, although including plants placed in the three categories, was more restricted, as a cheap and ready source of the pure chemical was not available when the tests started.

It was successful in causing better root formation than in the control series with 55 per cent. of the species tested.

Although tested with fewer species, the close approximation of the results obtained with the other chemicals tested is clearly apparent.

Proprietary Solutions.

The manufacturers of several of the proprietary solutions declare the contents and concentrations of their preparations, so that users should experience no difficulty in this respect. Several solutions are sold with particulars and devices for assisting in making the requisite dilution. The use of diluents likely to cause the growth of bacteria, or moulds—and some of the growth substances themselves are known to assist bacteriological growth—is disadvantageous in this respect. The sale of the less active phenyl acetic acid is likely to be restricted.

Speaking generally, the proprietary solutions available have given satisfactory results; they also do not cause every cutting of all species to root, but they too facilitate propagation.

Solutions of the chemicals prepared in satisfactory solvents may also be purchased from druggists and manufacturing chemists; they only require dilution.

Acknowledgments.

The writer expresses his thanks to Professor F. E. Weiss, F.R.S., for his continued interest in the investigations, and for his notes concerning the histological changes observed in herbaceous tissues.

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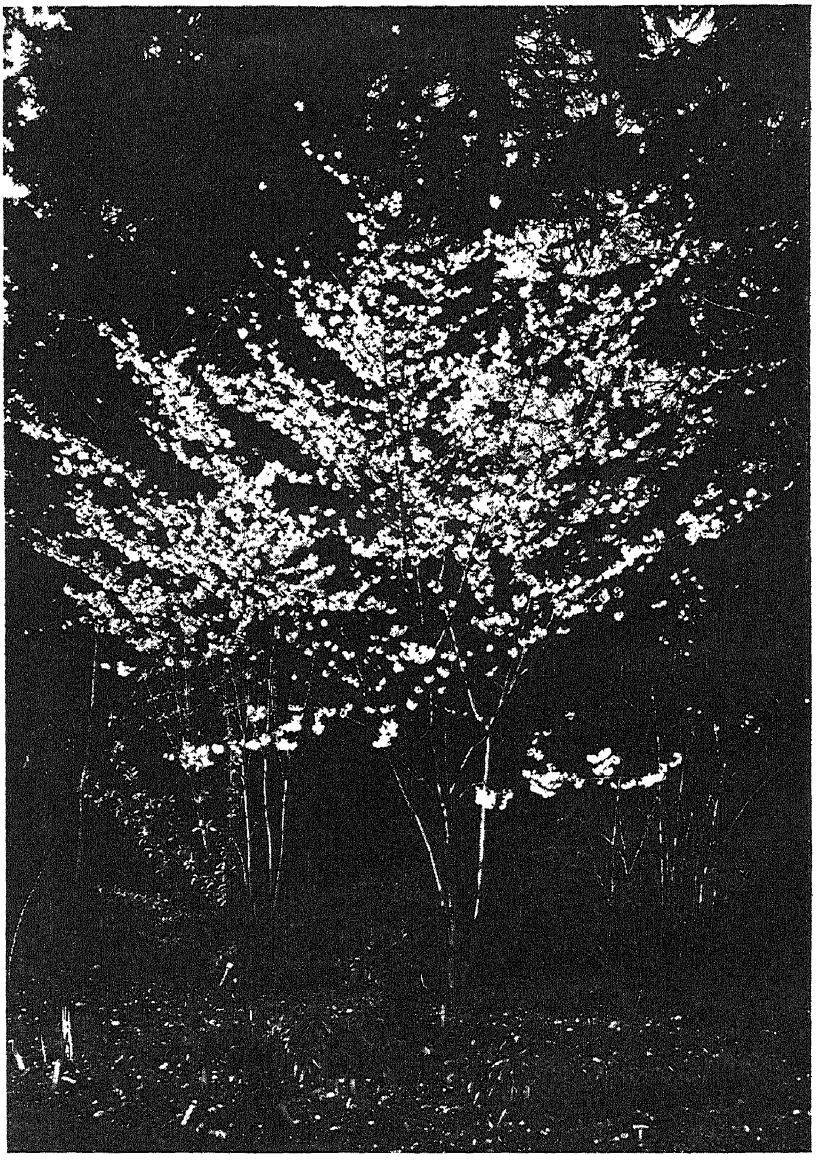


FIG. 55.—PRUNUS CONRADINAE AT NYEWOODS.

[*To face p.* 228.



FIG. 56.—PRUNUS INCISA SERRATA AT NYEWOODS.

UNWIN he is indebted for his great care in registering the rooting of cuttings and assistance in many other ways. He thanks also Dr. P. W. ZIMMERMANN, Professor T. CAMPBELL JAMES, D.Sc., F.I.C., and Professor F. M. ROWE, D.Sc., F.I.C., for chemicals synthesized in their laboratories. He is also indebted to Dr. L. LIGHT for co-operation regarding solvents, and to the following business houses for kindly providing samples of their products: Messrs. Boots Pure Drug Co., British Drug Houses, Ltd., Messrs. May & Baker, Imperial Chemical Industries, Ltd., Messrs. Mercke & Co., Inc., The Pennsylvania Chemical Co., and The Root Gro. Chemical Co.

THE LILY SEASON OF 1937.

By A. GROVE, F.L.S.

THOSE who keep records of the weather in this country know that change and contrast are its most marked peculiarities. They are so marked that to find a greater meteorological contrast than that provided by the winter of 1936–37 and that which is now at its end, would involve much searching of records.

Last winter was unusually mild and abnormally wet. There was more rain in February of 1937 than in any of its sixty predecessors, and the first three weeks of March saw twice the normal precipitation. This year, an abnormally dry February laid the foundation of what has since extended to a drought; and in contrast to the weather of its predecessor of 1937, the first half of the present winter was unusually cold.

It is true that once their roots are active, most Lilies will tolerate much moisture. Just how much, of course, is not known, so as the early weeks of 1937 went by and Lily stems began to push up, it was a relief to find few gaps in the ranks of established bulbs. *L. Willmottiae* was the only species under my observation that failed to adapt itself to the aqueous conditions. Mr. SCRASE DICKINS tells me that his experience with this Lily at Coolhurst coincided with mine; so after years of cultivation it is disturbing to find that a Lily which has earned a reputation as a good garden plant, has an unsuspected weakness in its constitution.

The Lily for which the name *L. Willmottiae* var. *unicolor* has been proposed, apparently, as an alternative to the name *L. sutchuenense* by which the plant is known at Kew Gardens, showed no sign of the white feather in the conditions which distressed *L. Willmottiae* itself. I have only had it under my eye for four years, but it is clearly a good garden plant with an astonishing power of bulblet production about the base of the stem. I do not know of any Lily except *L. longiflorum* to compare with it in this quality —the more valuable as the Lily seems to be definitely sterile to pollen of its own kind. The stem is not so tall as that of *L. Willmottiae* and is less pliant; indeed, it does not need the support of a stake on which the other relies if the tip of the stem is not to bend over and eventually collapse. Horticulturally, the plant, which lacks something of the indefinable character of *L. Willmottiae*, is very different from that species, and its specific position seems to need investigation. Its geographical origin and range are not precisely known and it may prove to be a cultivated clon. As the plant is not to be raised seminally and must be propagated vegetatively, it is to be hoped that British stocks may not be infected with a virus.

As is always the case, the behaviour of Lilies generally in 1937 turned on the weather, for, given good cultivation, there can be few gardens where that is not the determining factor in their annual behaviour. The keenest enthusiast can make himself independent of almost any climatic departure from what is regarded as the normal except an out-of-season frost like that of May 1935, and the sun on which so much depends. On the whole, the sun was in a generous mood last year, and the bulbs of Lilies must have ripened well. Whether the combination of cold and wet which characterized the early part of the present winter has left its mark on them remains to be seen ; but in mid-March the promise is not disquieting. It is plain that, in general, Lilies are not so precocious as they were a year ago, and it is probably unnecessary to look beyond the drought for the reason.

THREE EARLY-FLOWERING CHERRIES.

By the Rev. Prof. E. S. LYTTEL.

OF the many kinds of ornamental Cherries which grow at Nyewoods there are three which I think I like best of all. I like them because they flower early and are therefore doubly precious. I like them because they bear with the utmost profusion medium-sized single flowers, which I personally prefer to the big double blooms of such later kinds as the ubiquitous Kanzan or Seki-yama. I like them also because all three have most graceful habits of growth, though each of the three is different in this respect from the others. Finally, I like them because they are really happy growers without being too rampant.

The names of the three are *Prunus Davidiana*, *P. Conradinae* and *P. incisa serrata*, in order of flowering. The first is, of course, not really a cherry but a peach. All three have been in cultivation for some years, and yet I seldom see them in other gardens.

Photographs of the last two, taken at Nyewoods, appear as figs. 55 and 56. Unfortunately I did not secure an adequate photograph of the first.

P. Davidiana, the Abbé DAVID'S Peach, flowers very early in February, sometimes in late January. Its habit of growth is very upright and pyramidal, though not so narrowly fastigiate as the popular cherry Amanogawa. It flowers freely in a young state, but its true beauty is seen only when it is thoroughly established and sending up long upright stems. Then every stem will be thickly clothed with inch-wide flowers of pure white. Long stems are quite priceless for big vases in the house. It lasts in beauty for a very long time, and is comparatively unaffected by bad weather, at least in a sheltered position. To do it full justice it should be planted so that it can be seen against a dark background. Mine shows up beautifully against a background of a big clump of old Scots pines. There is a rose-coloured variety which has a less upright habit of growth, and to me is not nearly so beautiful. In a well-known shrub catalogue I see that *P. Davidiana* is listed as "not satisfactory in the South and West." I deny this. It grows and flowers magnificently at Highdown, and a younger tree is doing very well at Nyewoods.

P. Conradinae (fig. 55) is one of WILSON'S great finds in W. Hupeh, China. It is of upright but spreading habit, and makes a most symmetrical tree of moderate size. It is very floriferous, and never fails to be smothered with inch-wide campanulate single flowers with notched petals. The blooms are flushed with pale pink when first open. My friend COLLINGWOOD INGRAM has a semi-double form. I have not seen this in flower, and I do not think I should like it as well as the

single form, though its flowers may last a little longer. This Cherry also demands a dark background. My photograph shows a young tree against a background of spruce firs. It was taken on March 1 this year, and that is about the average time of flowering in this district on the south coast.

P. incisa, the cut-leaved Cherry of Japan, was discovered long ago, but it was not till early in this century that WILSON introduced it into cultivation. There appears to be some confusion as to the variety called *serrata*. BEAN, in his third volume, gives only one distinction between this variety and the type. He says that the toothing on the edges of the leaves with *serrata* is generally single rather than double, but more sharply pointed. My small experience in my own garden, and from observation in other gardens and nurseries, agrees with BEAN'S slight distinction as to the leaves, but adds a much greater distinction in habit. I grow a good many bushes of *P. incisa*, obtained from several sources, and in every case it makes a twiggy bush which is distinctly upright in habit. On the other hand, the variety *serrata*, if grown naturally, makes a bush which tends to spread laterally. Fig. 56 shows this distinctive habit. This bush was planted five years ago and is quite 10 feet in diameter, twice as wide as any of my type *incisa* planted at the same time. But I notice that BEAN'S illustration of the type is spreading rather than upright, so there seems to be confusion somewhere.

Anyway, *serrata* as I grow it is quite distinct in habit from *incisa* as I grow it, and is in my opinion a finer shrub. It is prodigiously floriferous, and every spring produces an amazing quantity of its inch-wide bell-shaped single flowers of pale pink fading to white. *P. incisa* type is also floriferous, but with me does not produce such overwhelming masses of bloom as *serrata*. This, of course, may be fortuitous, and I do not suggest it is a constant distinction like the habit. Both varieties are good growers, but need to be thoroughly established before they give of their best.

This Cherry should also be grown against a dark background, but as it flowers later than the other two it does not need such a sheltered site. It generally flowers at the beginning of April. My photograph was taken on April 1 last year.

SOME OF THE WINTER PLANTS OF AGADIR.

By Lt.-Col. ARTHUR A. CROOKSHANK.

THE ingenuity employed by human beings in advertising is considerable and almost entitles some of the species to be labelled in museums or text-books as *Homo sapiens*. A good example in recent years was that employed by the Highlands of Scotland in the case of the Loch Ness monster. What Agadir did was to get Germany to send a warship—the famous *Panther*—there in 1911. This put Agadir on the map, gave it a place in the sun most effectively, and an advertisement which has lasted long. Newspapers ever since and even now still talk, from time to time, of the "Agadir" incident.

Agadir has, however, other claims to our consideration than those connected with the claws and the jaws of the *Panther*. It is one of those few fortunate places which have, from the point of view of the inhabitants of Northern Europe, a good winter climate; it has been much favoured by Nature, it is one of the few spoilt children of geological evolution. It lies close up against the south side of the Atlas Mountains, a windscreen of which Mt. Toubkal or Taddert is 13,700 feet high (a little less than the highest mountain in Europe), which protects it from the cold north and north-east winds which are the prevailing winds there.

It faces south, so that the lower slopes of the mountains on which it is built are tilted up towards the sun, and the fronts of the houses face both the sun and the sea. Even in London, where winter sunshine is not excessive either in quantity or in heat giving, there is a great difference between the south and the north side of a house. Agadir also lies on the sea, which acts as a kind of central heating or rather as a heat regulator, preventing high temperatures by day and low temperatures by night, *i.e.* maintaining a low diurnal variation (a few miles inland you get frosts by night and great heat—over 90°—by day, even in winter). Agadir also lies on an immense bay with miles of sandy beach. It is evident, then, that Agadir has all the natural conditions necessary for a good winter climate. The only other places similarly endowed by Nature roughly due south of England (and therefore on a straight line to the tropics and winter warmth) and within easy reach are: (1) the coast line from Villefranche to Mentone on the French Riviera (windscreen the Alpes-Maritimes, in which Argentera is 10,800 feet); (2) the coast line near Motril about half-way between Malaga and Almeria in South Spain (windscreen Sierra Nevada, in which Mulhacen is 11,400 feet); (3) the coast line near Los Cristianos in south-west Tenerife (windscreen the famous Peak Teyde, 12,200 feet high). With Agadir this makes a total of only four, two on the Mediterranean and two on the Atlantic. The two

places on the Atlantic have the merit of having a smooth sea (the prevailing wind being the north-east trade, the Gulf-stream also comes from the north)—they have consequently good sea-bathing. The sea shores elsewhere in the north-east Atlantic are pounded by gigantic rollers, making sea-bathing very dangerous. So much for the winter climate of Agadir as regards wind and range of temperature. As regards hours of sunshine, suffice it to say that a short motor run of 100 kilometres to Tiznit to the south brings you to the Sahara desert. Agadir without a doubt has a place in the sun. As regards rain, the rainfall at Agadir averages 220 mm., *i.e.* about one-quarter of the rainfall of Tangier (810 mm.), and one-third that of London.

The result of all this generosity of Nature is that in mid-winter at Agadir the horticulturist can, in the intervals of looking for plants, spend one day lying on the beach in a minimum bathing-dress basking in the hot sunshine and flopping into the warm sea water from time to time whenever he feels hot—sea water which has a minimum temperature of about 65° F. In other words, at the coldest time of the year at Agadir—say in January—the temperature of the sea and of the air also is the same (in monthly average) as at the hottest time of the year in the south of England.

You can spend another day enjoying winter sports, ski-ing in the snow fields of the Atlas Mountains at an altitude of 8,000 to 10,000 feet or higher, by motoring along the road from Agadir and Taroudant to Marrakech. This road was originally built by the Foreign Legion for military purposes and crosses the Great Atlas range near its highest peak, Mount Toubkal, 13,700 feet, due south of Marrakech.

The third day you can spend, by way of contrast, dying of thirst in the Sahara desert if you like, by motoring southwards to Tiznit, a run of only 100 kilometres, and then going for a short walk.

Agadir has one other merit—it is said to be the only good anchorage, the only roadstead where there is smooth water along the coast of North-West Africa, and north of the Tropics. This is due to the sharp bend eastwards from north to south of the coast line at Cape Obir, 40 kilometres to the north, and another similar bend at Agadir itself. The French are consequently thinking of making a deep-water harbour there, and with that a port of call, a transit and refuelling station for South American and South African ships which now use Las Palmas and Santa Cruz.

As regards the flora of Agadir, a rainfall of 220 mm. means semi-desert, *i.e.* low scrub consisting of plants which are goat- or camel-proof on account of thorns, milky sap or nasty taste, unless there is water on or near the surface. The country within a radius of a day's walk may be divided into three areas : one along the coast to the north towards Cape Ghir (French, Cap Guir), forty kilometres away. This is the Cape where the main watershed of the Great Atlas plunges into the Atlantic in high sombre-looking cliffs. It has been dreaded by sailors, *i.e.* by sailing vessels, ever since the days of Prince Henry the Navigator, and probably before his time also. The coast line

turns sharp east from north to south at Agadir, then south towards Ifni, so that it lies on a quadrant-shaped bay; a second area inland to the east, and a third along the coast to the south. The first two areas are semi-desert country, which of course has its winter flowers, but they are not of much garden interest and they want looking for. In the third area there is a strip of land, a big trough about 8 kilometres long and 100 metres wide running parallel to the sea to the mouth of the River Sous and only separated from the sea by a high bank or dune of sand. This may be the dry bed of an ancient branch of the river, but the fact is that the water-table is high in this trough, due probably to infiltration from the river itself or to seepage from the sea. There is water near the surface—the result is that in this trough the conditions are not semi-desert but just the opposite; there is a luxuriant vegetation in mid-winter, shrubs and a carpet of flowering plants. As you walk along it you cannot help treading on and crushing flowers, a thing which any plant lover hates doing and looks upon as a form of cruelty. For some time past it has been possible to measure and throw on to a screen the movements (similar to the writhing and reaction of an animal in pain) of *Mimosa pudica* when hit, pinched or cut, its insensitiveness to wounding when under an anæsthetic and the contortions of its death agony. From that stage it does not seem a long step to talking of cruelty to plants. The River Sous drains the south slopes of the Great Atlas Mountains and in winter is about 20 metres across near its mouth. The valley is very fertile, having a rich soil and water only a few metres below the surface—it is said to produce four crops a year, and Asparagus, Tomatos, and French Beans all through the winter. At the head of the valley there are minerals (copper, silver, tin and iron) which have been worked for centuries past. These various forms of potential wealth partly explain the arrival of the *Panther* in 1911 as previously mentioned.

The following is a list of plants at Agadir which might attract the notice of visitors at the time of the year (January, February and March) when they are most likely to be there. Taking the biggest objects first, we shall not have to spend many sleepless nights in selecting the best of the trees, because there is only one to choose from. We are, of course, not dealing here with the Great Atlas Mountains where there are still left a few unhappy, ragged and "down and out" looking specimens of *Callitris quadrivalvis* (*Thuja articulata*) which has a wood with a beautiful pattern and colour used much in cabinet-making and roots used in tanning leather. These roots, for which the native name is 'arar,' form at present one of the chief exports of the port of Agadir. Large stacks of it can be seen on the quays. The Great Atlas range also has *Juniperus thurifera* and *J. phoenicea* (from which tar is made), and *J. Oxycedrus*. Nor are we here dealing with the Middle Atlas Mountains where there are immense forests of huge trees, among which is *Cedrus atlantica glauca* (or *argentea*), the most beautiful evergreen tree in Nature, which is often over 100 feet high.

Our one and only tree (for this and other reasons a beauty prize

will not be given) at Agadir is *Argania Sideroxylon* (syn. *Sideroxylon spinosum* and *Elaeodendron Argan*). It does much better at Mogador (on the coast and 180 kilometres into the north), where in French maps it is dignified with the name of "forest." It is a tree which botanists get very excited about, but which leaves outsiders stone cold. It is said that botanists have come from the uttermost parts of the earth especially to see it, the reason being that it occurs nowhere else in the world (not a very good reason, as 34 per cent. of the flora of Tenerife just across the water is endemic), also that it has no business to be there. It belongs to an order (Sapotaceae) which is wholly tropical, and Mogador is 8° north of Cancer (Agadir is 7° or about 500 miles out of the tropics). This tree is very like a poor specimen of an Olive, *Olea europaea*, having the same low-branching gnarled and twisted trunks looking as if they were wriggling in pain, but not taking the fantastic shapes of the old Olives in Majorca which remind one of prehistoric animals (the groves look like a sort of prehistoric Whipsnade) and are quite frightening and nightmarish on a moonlight night—the Olives near Valdemosa which GEORGE SAND describes in such beautiful language, and probably CHOPIN also but in another language, which only the very select few can understand. Argania has a seed or drupe very like an Olive, which similarly provides good oil, but it is not edible (for human beings) and as a tree it has not the chameleon-like gift the Olive has of being able to change colour miraculously and instantaneously at the touch of a passing gentle zephyr to silver all over by reversing its leaves. It has big thorns which the Olive has not. From the point of view of the uninitiated the chief merit of this tree is that it has leaves on it all the winter, and as such better than nothing (the alternative being bare brown hills or plains, *i.e.* desert). It has a close, hard wood, as its name indicates, and so heavy that it sinks in water. It provides climbing exercise and practice for goats, helping them to keep their eye (or toes) in for dangerous rock-climbing (and for standing on top of empty bottles) in places where there are no cliffs. This district must be one of the few places in the world (if not the only place) where goats can be seen climbing trees and peacefully nibbling at the top of trees 10 to 15 feet high (the tree often branches at ground level and does not rise vertically but at a flat angle—the bark is rough).

As regards the next biggest objects, shrubs, there is a slightly larger entry for the flower show than in the class for trees, *i.e.* a few more than one, but not many more. The prize goes to *Acacia gummifera*. This big shrub (or small tree)—like Argania—does better at Mogador than at Agadir. At Mogador it forms large thickets of trees 10 feet high or more and so dense that they are impenetrable in places. While trying to push your way through you may, if lucky, find one of those curious creatures a chameleon (*Chamaeleo vulgaris*, though they are by no means *vulgaris* in these parts). They are very difficult to see, as they are, or are supposed to be, able to change their own colour to match their surroundings and make no movement. They have

large protruding eyeballs completely covered by the eyelid except for a small hole which shows only the pupil. It can focus its eyes, which enables it to shoot out a tongue, sometimes 8 inches long and longer than the creature itself, and capture a fly or insect at the end of it. This is putting out one's tongue with a vengeance. This chameleon can also revolve its eyes independently, looking forward along its nose with one eye and back along its tail with the other. This is squinting with a vengeance. With its large head, saw edge spine, it looks like a miniature pantomime dragon or a peep into prehistory. *Acacia gummifera* is very ornamental, the tree being covered with yellow balls about the size of a Cherry—golden cascades of them. The flower is similar to that of *A. Farnesiana* of the West Indies. Next on the list comes *Genista monosperma* (*Spartium monospermum*), a shrub 3 to 4 feet high covered with tiny white flowers with silky petals—it fills the air with its delicious and strong scent. It is often seen in gardens on the French Riviera. This shrub grows and thrives on bare sand and is used in North Africa for checking the spread of sand and the advance of sand dunes and desert. *Cytisus albus* is 6 to 10 feet high and has a large white flower (large for its kind) in long racemes. *Tamarix africana* provides welcome patches of green against a background of sand.

We now come to the plants—in this class there is an *embarras de choix*. If you go to Agadir by the sea-coast road from Mogador you cross over the main watershed of the Grand Atlas range near Cape Ghir, 40 kilometres from Agadir. This run of 40 kilometres is 40 kilometres of the best on a sea-coast road giving views across the Atlantic. From the ridge the road hairpins down ; to the north the high cliffs of Cape Ghir rise in a dark wall, at the foot of which is the white line of the waves dashing against it. A fleet of fishing vessels may often be seen at anchor sheltering from the storms of the ocean in the smooth water and calm roadsteads of the bay North of Cape Ghir. The road then runs along near the sea all the way, the huge rollers of the Atlantic come roaring in and on to the rocks or sandy beaches in parallel lines of white breakers—it is magnificent wild scenery and on a grandiose scale. The road reminds one of other similar " Corniche " roads, the roads from Toulon to Mentone in the French Riviera, from Malaga to Almeria in South Spain, from San Sebastian to Zarauz Guetaria in North Spain ; the sea-coast road round the island of Tenerife and those in the islands of La Palma and Grand Canary, though not like some of the above roads in one respect, the absence of " civilization " and signs of human habitation and handiwork. At the Cape Ghir ridge the vegetation changes abruptly—it is like being suddenly carried on a magic carpet to a new country, Mediterranean types are left behind and Sahara desert types appear. Two of these tell-tale plants, which do not occur in neighbouring districts, are a conclusive proof that you have crossed the frontier of a country with a warmer winter. You need not worry any more about meteorological statistics about the winter climate ; you can throw away the official figures and data. These two plants

are large and would be noticed at once by any travellers however fast they were humming along the road. One is *Euphorbia Beaumieriana*, called by the French guide books *E. cactoides*; it is nearly related to *E. officinarum* of British East India. To the amateur it looks very like *E. canariensis*, which is so common on lava streams and such a characteristic feature of the landscape near the sea (in the maritime belt) in the Canary Islands, except that the latter is a bigger plant (6 feet high as against 3 feet). It consists of vertical green stems, pentagonal in cross-section, 1½ inch in diameter, with tufts of spines along each vertical ridge and a few small flowers at the top of each stem. In *E. canariensis* the flower is like a crushed red currant. The smallest cut made in the soft cucumber-like stem produces a rush, a sort of waterfall (like turning on a high-pressure water-tap), of white milky sap which does not look like ever stopping—so much so that you are afraid the poor thing will bleed to death—you feel ashamed of your cruelty and you want to run away and hide for a bit and hope nobody saw you do this dastardly deed, this bit of dirty work. In *E. canariensis* this sap is poisonous and if you get some of it in the eye it causes blindness. Fortunately Mother Nature has thoughtfully and generously arranged that *Rumex Lunaria* grows near it or under its protection (against goats and camels); the cure for this blindness is the crushed leaf of this Rumex pressed against the eye. Native fishermen in the Canary Islands use this milky sap for stupefying fish. The other tell-tale plant is *Senecio pteroneurus* (*Kleinia pteroneura*); it also consists of green vertical cucumbery stems or columns about ½ inch in diameter and 2 feet high, at the top of which is the flower (usually single, like a tiny parasol) ⅜ inch in diameter, of the usual Composite type and yellow.

We can now go on to flowering plants which we can choose for aesthetic reasons and which may be of garden interest. The beauty prize is not at all easy to award, there are such numbers of beautiful flowers—perhaps the most striking from the point of view of big effects is *Anagallis collina* (*A. fruticosa, A. grandiflora*). This is also a plant which does better at Mogador than at Agadir. It forms cushions 3 feet in diameter which are solid unbroken masses of colour and can be seen a long way off. The flower is a brownish-red or vermilion with a purple centre and ½ inch in diameter,with yellow stamens and five petals. There is another Anagallis, viz. *A. Wilmoreana*, with a flower of the same size but of a beautiful bright blue-purple. It is single, the plant is 3 inches high and not woody and gregarious like *A. collina*. *Spergularia media* (*S. diandra*) also makes noticeable patches of continuous colour in the landscape 3 to 5 feet across and 9 inches high; the flower is pink, ½ inch in diameter, has five separate oval petals and yellow stamens. *Paronychia capitata* makes patches of dull white close on the ground, the flower is very small and has white bracts which look like crinkly rice paper.

So much for plants which go in for "mass effect"—we will now consider plants which have beauty or interest on a smaller scale. In

this class also it is difficult to award the beauty prize, but there are some Statices which take your breath away and pull you up dead in your stride when you see them. *Statice ornata* has profuse flowers of white with bright blue bracts, the plant is 2 feet high, the stem rises from a centre of a large circle of leaves, arranged like the spokes of a wheel flat on the ground, the leaves are deeply cut rather like those of the Dandelion. *S. Thouinii* and *S. sinuata* are similar. *S. mucronata* has tiny but profuse flowers of a soft pink or mauve arranged like Limonium ; it is prickly as its name indicates. All these Statices have the merit of being "everlasting." *Anthemis punctata* has a striking and beautiful flower 3 inches in diameter arranged in concentric rings of five different colours, the disc being brown, pink and black, the rays yellow and white ; the dots in the disc reflect light and make it look like a button of tiny flashing jewels or coloured metals ; the plant is 2 feet high and the leaf finely divided. It is much used in local gardens. *Lavandula pinnata* comes between *L. multifida*, of the Mediterranean, and *L. abrotanoides*, of the Canary Islands. It is a sort of transition, as might be expected. The flower is of a beautiful deep blue colour and very ornamental, but makes a bad cut flower. *Nonnea violacea* (*Lycopsis violacea, Echioides violacea*) is a very curious-looking plant of the order Boraginaceae. It is 6 inches high in a single unbranched stem and very hairy throughout, the leaves are very crowded (pagoda fashion) and are red at the top of the stem, the flower is tiny, purple, and has a long calyx tube. *Phelipaca lutea*, a parasite on Chenopodium, rises up from bare sand in a yellow cylinder 2 feet high (or more) and 4 inches in diameter—it is the king or giant of broom rapes. One authority states that the correct spelling is "*Phelypaca*" and in another part of the same work explains that the plant was named after a Frenchman, PHILIPEAUX (a friend and patron of TOURNEFORT). It would appear then that the correct spelling is Philipaca. *Asteriscus maritimus littoralis* (*Odontospermum maritimum*) has a yellow flower 1 inch in diameter lying in the junction of several stems. *Asteriscus imbricatus* is similar. *A. graveolens* has a similar flower—it is a very beautiful plant as both leaves and stem are of a pale blue-grey colour and felty ; it is 2 feet high. *Linaria ventricosa* (or *L. sagittata*) has a yellow flower with brown veins, the plant is 3 feet high, the name is doubtful; when first examined it was thought to be a new species ; only one plant was found. *Salvia bicolor* is in pagoda form. It has a mauve flower in whorls ; both stem and leaves are felty. *Heliotropium europaeum* is similar to the common or garden species (*H. peruvianum*) but the flower is very pale mauve and unscented. *Calendula suffruticosa* has a flower over 1 inch in diameter, of a beautiful orange colour. *C. tomentosa* has a similar flower with large soft felty spathulate leaves. *Prenanthus spinosa* (*Sonchus spinosus, Zollikoferia spinosa*) is a curious plant, consisting of a mass of nothing but thorns like a heap of tangled barbed wire, the flower of composite type is yellow and $\frac{5}{8}$ inch in diameter, it has a milky sap like others of the Sonchus species. *Fagonia cretica* has a pink flower rather like

Saponaria, ½ inch in diameter, with separate petals and yellow stamens, it keeps low on the ground and is very thorny. *Teucrium fruticans* has a flower ½ inch deep of a soft pale grey-blue with a big lip, the leaf is grey on the underside. This plant is often used as a hedge in gardens in the French Riviera; it ought perhaps to have been placed amongst the shrubs. *Lotus creticus* is a beautiful plant with leaves and stems of pale grey-blue, the flower is yellow in a close head 1 inch across. *Mesembryanthemum cristallinum* spreads its big curly and thick fleshy leaves covered with tiny crystals which sparkle in the sun like diamonds. *M. nodiflorum* has yellow-white flowers ½ inch in diameter, like sea anemones, and leaves which sometimes are of a beautiful deep-red colour. *Cheiranthus semperflorens* has a flower which is nearly white, it is 6 inches high and flowers all the year round, as its name indicates. *Amberboa Lippii* (*Centaurea Lippii*) has a blue flower ½ inch in diameter. *Teucrium Polium* is a pretty plant with a tiny red flower in a half-ball ½ inch in diameter, leaves and stems are pale blue-grey. *Pyrethrum fuscatum* has a yellow flower 1 inch in diameter and leaves of green wire. *Asphodelus tenuifolius* (*A. aestivus*) has linear leaves; *A. fistulosus* hollow cylindrical leaves. They have flowers of the usual type, white, trumpet-shaped, ½ inch in diameter with a light brown vein on each petal. *Rumex pulcher* (*R. sanguineus, R. vesicarius*)—most people would raise an eyebrow or an ironical laugh or a jeer at the idea of a Rumex being put on a selected list, but nevertheless the flower head of this plant is of a bright red colour and is both beautiful and striking. *Euphorbia bi-umbellata* is a nice little plant about 6 inches high with two umbels (as the name indicates) of yellowish-brown flowers. *Cyperus capitatus* has a single stem and flower like a brown ball ½ inch in diameter and two opposite linear leaves just below the ball. There are three Erodiums, of which one, *Erodium malacoides*, has a pink flower ½ inch across, and two Resedas, also our old friends *Sisymbrium Irio*, which we will place among the "ubiquists," and *Scilla peruviana* and *Iris Sisyrinchium* already noticed at Algeciras (on our way to Agadir). *Dipcadi serotinum* reminds me of *Bellevalia romana* (*Hyacinthus romanus*); the flower is pale brown or fawn and like a Hyacinth, the leaves are linear and lie about flat on the ground in curves twisted like thin green snakes. *Matthiola tristis* (*M. parviflora*) is 6 inches high and has a pink flower ½ inch in diameter. *Androcymbium punctatum* has a white trumpet flower 1½ inch in diameter with separate petals, single, it lies on the ground, stemless, like some species of Crocus. *Euphorbia Paralias* displays its curious tail 2 feet long and ⅜ inch in diameter and its green flower on the seashore as in England—another ubiquist. *Picridium orientale* has a striking and pretty flower 1½ inch in diameter with yellow rays and black disc, the leaves are toothed. *Glaucium corniculatum* is similar to *G. flavum* (*luteum*) but has an orange-red flower. *Striga orobanchoides* has a single spike 2 feet high with a tiny red flower at the top—it can be found hiding in *Euphorbia Beaumieriana*—its only chance of escaping the attention of goats. Last and one of the least, as regards size of flower, is *Thymus Broussonnetii*.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Angraecum superbum. A.M. March 22, 1938. This plant is a native of Madagascar, and in former years was generally considered as a variety of *A. eburneum*, from which it differs chiefly in having a broader labellum. The present specimen carried three spikes, each with six flowers, mainly ivory-white tinged with green. Exhibited by the Hon. Lord Methuen, Corsham Court, Wilts.

Anthurium Andraeanum 'Cupid.' A.M. March 22, 1938. From James A. de Rothschild, Esq., M.P. (gr. Mr. G. F. Johnson), Aylesbury. A variety with a large handsome orange-scarlet spathe of excellent shape. It is the result of a cross between 'Yvonne Johnson' and a salmon seedling.

Anthurium Andraeanum 'Master Maximilian.' A.M. March 22, 1938. From James A. de Rothschild, Esq., M.P. A variety with a large cerise spathe. It resulted from a cross between a pink seedling and *A.* 'Souvenir de Monsieur Hardy.'

Anthurium Andraeanum 'Phoenix.' A.M. March 22, 1938. From James A. de Rothschild, Esq., M.P. A very striking deep crimson variety with a large well-shaped spathe. It was produced by crossing *A. atrosanguineum* and a dark seedling.

Anthurium Andraeanum 'Rubrum.' A.M. March 22, 1938. From James A. de Rothschild, Esq., M.P. This variety has a large shining scarlet spathe of good shape. A cross between *A. Andraeanum* and *A.* 'President Bellairs.'

Chorizema cordatum splendens. A.M. March 22, 1938. From Messrs. Russell, Windlesham. A very graceful and pretty Australian shrub, which flowers for a long period in the cool greenhouse. It is of rapid growth, producing slender, wiry branches bearing spiny-toothed ovate-lancelolate leaves and terminal racemes of dainty orange and purplish-red flowers.

Cymbidium × 'Edzell' var. 'John Linford.' A.M. March 22, 1938. This distinct Cymbidium is the result of crossing *C.* × 'Ceres' with *C.* × 'Lysander.' The spike bore six flowers; the sepals and petals reddish-crimson, the labellum having the front lobe of intense crimson colour. Exhibited by the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey.

Cymbidium × 'Pharos' var. 'Paragon.' A.M. March 22, 1938. This charming hybrid bore two spikes, with eight and ten flowers respectively, cream-coloured, the labellum profusely marked with small reddish spots. The result of crossing *C.* × 'Flamingo' with *C.* × 'Warbler.' Exhibited by Messrs. H. G. Alexander, Tetbury, Glos.

Cymbidium × 'Ramboda' var. 'Monarch.' A.M. March 8, 1938. The spike bore five unusually large golden-green flowers, the labellum profusely marked with crimson. The result of crossing *C.* × 'Pearl'

with *C.* × ' Venus.' Exhibited by the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey.

Cymbidium × **' Rio-Rita.' A.M.** March 8, 1938. The spike bore thirteen flowers in which the sepals and petals were emerald-green, the labellum creamy white with a crimson margin to the front lobe. Produced by crossing *C.* × ' Pearl ' with *C.* × ' Ruby.' Exhibited by Messrs. J. & A. McBean, Cooksbridge, Sussex.

Hepatica × **media Ballardii. A.M.** March 8, 1938. From Ernest Ballard, Esq., Colwall, Malvern. A very vigorous Hepatica of erect habit, producing 9–12-inch stems with large leaves and flowers, some nearly 2 inches in diameter, of a pale lavender-blue.

Leucojum trichophyllum. A.M. March 22, 1938, as a flowering plant for the alpine house. From Lt.-Col. Grey, D.S.O., M.C., Hocker Edge Nurseries, Cranbrook. A Moroccan species bearing white pendent bells, tinged with red at their base, on 6–8-inch stems. Bright green, glossy, very slender foliage.

Miltonia × **' Melina ' var. ' Vivid.' A.M.** March 22, 1938. An immature plant with a single flower of large size and blood-red in colour. The result of crossing *M.* × ' Memoria H. T. Pitt ' with *M.* × ' Mrs. J. B. Crum.' Exhibited by Messrs. J. & A. McBean, Cooksbridge.

Narcissus ' Fairy Wings.' A.M. March 22, 1938, as a variety for the alpine house. A dainty *cyclamineus* hybrid (Division 6), obtained by using the pollen of *N. poeticus*, but showing little resemblance to that species. The flowers were poised almost horizontally on 8-inch stems. The perianth segments, which were nearly an inch long and about half as broad, were amber-white, suffused with yellow at the base, and completely reflexed. The cup-shaped corona was not quite ½ inch in length, and aureoline-yellow in colour. Raised and shown by Mr. G. S. Crouch, Fairseat Nurseries, Wrotham, Kent.

Narcissus ' Huntercombe.' A.M. March 8, 1938, as a variety for exhibition, raised and sent by Mrs. R. S. Cobley, Chircombe, Bideford. A neat bicolor Incomparabilis variety (2b) with flowers just over 4 inches in diameter, well poised on stout 17-inch stems. The smooth, broad, overlapping, sulphury-white segments are 1¾ inch long. The cup-shaped corona, 1$\frac{1}{16}$ inch long and 1⅛ inch wide at the mouth, is deep cadmium-yellow at the base, passing to pale amber-yellow at its indented margin.

Narcissus ' Monaco.' A.M. March 22, 1938, as a variety for exhibition. A shapely bicolor *incomparabilis* variety (Division 2b) with a flower 4 inches in diameter, well poised on a stout 18-inch stem. The smooth, overlapping perianth segments were 1¾ inches long and pale creamy-white, faintly suffused with yellow at the base. The neat, pleated, pale Chinese orange corona was ¾ inch long and 1½ inch in diameter. Raised and shown by Mr. J. L. Richardson.

Narcissus ' Polindra.' F.C.C. March 22, 1938, as a variety for exhibition. This bicolor *incomparabilis* variety (Division 2b), raised by the late P. D. Williams and shown by Mr. J. L. Richardson, received an **A.M.** for exhibition on April 17, 1937. See JOURNAL R.H.S., **62.** p. 260.

Narcissus 'St. Issey.' A.M. March 22, 1938, as a variety for exhibition. A large, almost self-coloured, *incomparabilis* variety (Division 2a), with flowers $4\frac{3}{8}$ inches in diameter, well poised on stout 23-inch stems. The perianth segments were broad, overlapping, $1\frac{13}{16}$ inch long, and buttercup-yellow. The corona, which was slightly expanded at the mouth, was $1\frac{5}{8}$ inch long, and of a slightly deeper tone than the perianth. Raised by the late P. D. Williams and shown by Mr. J. L. Richardson.

Narcissus triandrus aurantiacus. A.M. March 22, 1938, as a variety for the alpine house. A pretty little plant, 6 to 8 inches high, collected on the rocky slopes of the Mondego valley, Portugal, and bearing one to three pendant, bright buttercup-yellow flowers on each stem. The narrow, twisted, completely reflexed perianth segments were $\frac{5}{8}$ inch long. The cup-shaped corona was $\frac{7}{16}$ inch long and about as broad. Shown by Miss C. Christie-Miller, Swyncombe House, Henley-on-Thames.

Odontioda × 'Acida.' A.M. March 8, 1938. The result of crossing *Odontioda* × 'Acis' with *Odontioda* × 'Florida.' The spike bore eleven flowers, with broad segments, mainly claret-red, the apex of the sepals and petals rose-purple, that of the labellum white. Exhibited by Messrs. Charlesworth, Haywards Heath.

Odontoglossum × 'Waveney.' A.M. March 8, 1938. This attractive hybrid, the result of crossing *O.* × 'Dodeham' with *O.* × *harvengtense*, bore a tall spike with eleven well-formed bright canary-yellow flowers with a few red-brown spots. Exhibited by Messrs. Stuart Low, Jarvis Brook, Sussex.

Odontonia × 'Rêve de Jour.' A.M. March 8, 1938. A pretty and distinct hybrid. The spike bore five bright yellow flowers, with red-brown spotting on the sepals, petals and expansive labellum. The result of crossing *Odontoglossum* × 'Rêve d'Or' with *Odontonia* × 'Ophelia.' Exhibited by H. S. Wharton, Esq., 12 Templewood Avenue, Hampstead.

Primula amoena. A.M. March 8, 1938. From Major F. C. Stern, O.B.E., M.C., Goring-by-Sea. A somewhat widely distributed and variable species of the Vernales Section. The plant exhibited was raised from seed collected in Asia Minor by Mr. E. K. Balls, and had several downy scapes 4 to 6 inches high, each bearing six to ten flowers. These were of an attractive shade of violet with small, yellow eyes. The Oxlip-like foliage was in a very early stage of development. A form with paler flowers is figured in the Botanical Magazine at t. 3252 (1833).

Primula Clusiana. A.M. March 8, 1938. From G. P. Baker, Esq., Sevenoaks. An attractive species with small rather fleshy entire leaves with revolute margins, numerous five- to seven-flowered umbels of a pleasing rich claret. About 3 inches high.

Rhododendron lutescens, Exbury var. F.C.C. March 22, 1938. Shown by Lionel de Rothschild, Esq., Exbury House, Southampton,

as a hardy flowering plant for the woodland garden. A very fine form of the species with numerous small trusses of up to six wide-open, clear lemon flowers up to 2 inches across; deeper in colour than usual in this species.

Rhododendron Macabeanum. F.C.C. March 8, 1938. Shown by Lt.-Col. E. H. W. Bolitho, Trengwainton, Heamoor, Cornwall. This species received an **A.M.** when shown by Lt.-Col. Bolitho on March 23, 1937, and is described in the JOURNAL, R.H.S., **62**, p. 224. The spray sent was slightly larger in all its parts than that exhibited last year.

Rhododendron × **'Seagull.' A.M.** March 8, 1938. From Lady Loder, Leonardslee, Horsham, Sussex. A cross between *R.* × *Loderi* and *R. sutchuenense.* The rather loose trusses contain twelve to fifteen funnel-shaped flowers, pure white, speckled crimson within on the upper segment, up to 3 inches broad by 2½ inches deep. The smooth oblanceolate leaves are dull green above and paler beneath with light brown tomentum on the veins; up to 8½ inches long by 3 inches broad.

Rhododendron × **'White Glory,' Leonardslee var. A.M.** March 22, 1938. Shown by Dame Alice Godman, South Lodge, Horsham, as a hardy flowering plant for general garden use. This plant differs from *Rhododendron* × 'White Glory,' which received an **A.M.** on April 20, 1937 (see JOURNAL R.H.S., **62**, p. 271) in its slightly larger, more compact trusses, and its wider corollas, which lack the spotting within at the back of the tube, but have a very delicate pink tinting on the outside.

Strelitzia Reginae. A.M. March 8, 1938. From Mrs. Percy-Jones, Orpington. The Bird of Paradise Flower was introduced to Kew from South Africa in 1773 and was well figured in the Botanical Magazine seventeen years later (tt. 119, 120). It is a most handsome plant for the cool greenhouse, succeeding best if planted in the border, where its roots can develop freely. The large, ovate-oblong, glaucous leaves are borne on stout petioles, and the erect scape often attains a height of five feet, bearing a terminal spathe from which about six brilliant orange and purple flowers are produced.

Viola sarmentosa. A.M. March 22, 1938, as a flowering plant for the alpine house. From Viscountess Byng of Vimy, Thorpe-le-Soken, Essex. Originates from Californian Redwood forests. It has a somewhat creeping habit, forming a loose mat. The flowers are bright sulphur-yellow, with purplish veinery on the lower petal, and are borne on 4–5-inch stems. A difficult plant to keep.

Vuylstekeara × **'Rosalie' var. 'Shalston.' A.M.** March 22, 1938. This interesting multigeneric hybrid results from the crossing of *Odontonia* × 'Duchess of York' with *Odontioda* × 'Laura.' The spike bore seven flowers in which the sepals and petals are reddish-brown, and the wide labellum golden-yellow with reddish-scarlet shading. Exhibited by H. S. Wharton, Esq., Templewood Avenue, Hampstead.

THE AWARD OF GARDEN MERIT.—XLIV.*

By F. J. CHITTENDEN, F.L.S., V.M.H.

230. VIBURNUM TOMENTOSUM MARIESII.

Award of Garden Merit, July 1, 1929.

The excellent shrub *Viburnum tomentosum plicatum*, sometimes called the Japanese Snowball Tree, from the round white groups of flowers that it bears so freely, is very well known and widely grown, but it is less widely known that the wild form of this shrub is very well worth growing, and though less formal is not less striking. Its almost horizontal branches, toothed ovate leaves, dull dark green above, greyish and hairy beneath, its 6 to 8 feet of height and wide spread are similar to *V. tomentosum plicatum*, but it differs in the inflorescence. In *V. tomentosum plicatum* all the flowers are alike, with expanded white petals, and being imperfect are incapable of producing seed. In the wild state only a few of the outer flowers of each inflorescence are expanded, white, and about 1 to 1½ inch across, the middle part of the flat group of flowers consisting of small perfect flowers which later produce red berries, turning eventually to blue-black. The inflorescences are set in two rows along the branches and measure up to 4 inches across in the best forms, of which the variety *Mariesii*, to which the Award goes, is one. This variety is named after Messrs. VEITCH'S collector, CHARLES MARIES. It grows wild in China and probably also in Japan, and may be reckoned among the best deciduous shrubs for a garden where it has room to grow unhindered. A fine seedling was raised at Lanarth, Cornwall, with even larger sterile flowers, which received the Award of Merit in 1930, but that is not yet widely available, as plants for this award must be.

It is not particular as to soil so long as it is not too dry, and it will tolerate chalk.

231. BERBERIS SIEBOLDII.

Award of Garden Merit, April 1, 1935.

Barberries, closely related to our native *Berberis vulgaris*, are found wild throughout the north temperate zone. They are not always easily distinguished from one another, but the Japanese *B. Sieboldii* is distinct by its smaller dimensions, fitting it better for the smaller garden, and by its globular, polished, yellow red racemes of fruit.

The bush is roundish, scarcely a yard high and has deciduous leaves very similar in shape to those of the common Barberry, with margins densely set with fine bristles. The fruiting racemes are about 2 inches long and the fruits about ⅓ inch across.

* Notes on plants which have received the Award of Garden Merit have been gathered together and published with the title Some Good Garden Plants. This can be obtained on application to the Secretary, R.H. Society, price 4*s*. Additional notes appeared in the JOURNAL, R.H.S., vol. **63**, p. 190.

Another Japanese species is sometimes grown under this name. It is *B. Regeliana* which, however, is taller, and has rosy carmine oblong fruits.

This, like *B. vulgaris*, appears to be at home on any type of soil.

232. Parthenocissus Henryana.

Award of Garden Merit, July 6, 1936.

Dr. Augustine Henry discovered this vine in Central China in 1885 and E. H. Wilson introduced it fifteen years later for Messrs. Veitch. It was then called *Vitis Henryana* but as explained when writing of *Parthenocissus inconstans*, the old genus Vitis has been split up into several well-marked sections, and as this plant has the discs on its tendrils which enable it to cling to smooth surfaces like the true Virginian creeper (*P. quinquefolia*) it is placed in Parthenocissus.

P. Henryana is somewhat tender in its young stages but is safe against a wall and best against a wall with a northerly aspect, for there the dark green leaves will develop better the silvery and pink variegation along the main veins which in favourable circumstances characterizes this species. The leaves are composed of three or five leaflets rather smaller than those of the Virginian creeper, but like them turning brilliant red in autumn—a very handsome climber, giving little trouble, and capable of covering high walls.

It is best planted out of pots and will succeed in ordinary soils but should be given a little leaf-soil to start with.

233. Philadelphus 'Avalanche.'

Award of Garden Merit, Oct. 5, 1936.

It is unnecessary to say anything regarding the soil or treatment necessary for this Philadelphus, for these things are dealt with in the notes on former Awards given to varieties of Philadelphus. The variety 'Avalanche' was raised by M. Lemoine of Nancy, who has raised so many good shrubs in this genus, about 1896. It gained its name from the arching habit of its branches bent down by the weight of its large, sweet-scented white flowers, which are borne in groups all along the stems. There is a woodcut in the Gardeners' Chronicle for Feb. 1897 showing its floriferous habit.

234. Philadelphus 'Belle Etoile.'

Award of Garden Merit, July 6, 1936.

This Philadelphus belongs to the section in which the milk-white petals have a purple blotch at the base, so that the flowers are purple-eyed. Some of these have the reputation of being less hardy than the commoner white-flowered species, but this is quite hardy, vigorous and free-flowered. Its cultural requirements are similar to those of other varieties. It gained an Award of Merit when shown by Mr. Notcott in 1930, and was raised by M. Lemoine, who introduced it into commerce in 1925.

BOOK REVIEWS.

"Hardy Bulbs. Including Half-hardy Bulbs and Tuberous- and Fibrous-rooted Plants." By Lt. Col. C. H. Grey, D.S.O., F.L.S. Vol. I. Iridaceae. 8vo. x + 403 pp. (Williams & Norgate, London, 1937.) 36*s.* net.

This is the first volume of an ambitious work and an attempt at dealing with all hardy or somewhat tender bulbous plants which are likely to prove successful in an English Garden. The term bulb, of course, must be accepted as a portmanteau word to include tubers, corms and rhizomes of mono- and dicotyledonous plants, for which, from the horticultural point of view, no apology is needed. There exist already monographs on a number of genera which deal exhaustively with their subject, but no other attempt at an encyclopædic review on such a grand scale has yet been made. The present volume deals with Iridaceae, the second will comprise Amaryllidaceae, Commelinaceae, Haemodoraceae, Orchidaceae and Scitamineae, and the last will be allocated to Liliaceae. Therefore, a full compilation of the members of this type of plant must be welcome to the interested and studious professional or amateur gardener. It will, of course, be understood that such a compendium does not profess to attain finality, but readers will be able to amend their copies as new knowledge comes to light.

The Iridaceae includes not only well-known genera like Crocus and Iris, which have already found their monographers, but many others which can only be found by consulting numerous Floras and other botanical works.

Much painstaking labour has been spent on the accomplishment of this task, sometimes with the help of trained specialists. The mechanical and clerical labour of hunting up the references to the immense number of species dealt with must have been very great, to say nothing of the task of translating the original descriptions from Latin or other languages. The book is written in an easy style which will not tire the reader and the botanical descriptions are sufficiently clear to create a mental picture of the species. The illustrations by Mrs. Grey have character and are pleasantly reproduced, although plates with a lighter background may appear more satisfactory.

On a point of hardiness experience must differ, and what cannot be grown by the writer near Hampton Court, may succeed under identical conditions in Cranbrook, as for instance *Haemanthus Katharinae*. But a mild meteorological gamble pleases everyone, and will not cause harm—until the next severe winter. Of course, it would be easier to control climatic conditions in a structure entirely reserved for sub-hardy bulbs than to attempt cultivation amongst a mixed lot of alpines.

The appreciation of the garden value of a plant remains a difficult problem for a reference book, and while it is easy to overrate, there may be a tendency to undervalue. Plant catalogues usually do not err on this side. The author is a good observer with a critical eye, who appreciates the quiet beauty of a plant like Hermodactylus.

The placing of bulbous plants in a rock-garden requires forethought, and in light soil profuse seeders like Muscari or Tradescantia should be avoided. Even *Crocus Tomasinianus* can become a nuisance. The dying leaves of bulbs should not interfere with the well-being of an alpine, but must not be removed. An earthy scree will be found invaluable for the cultivation of the more difficult bulbs.

We thoroughly agree with the advice of good drainage for pot and outdoor work, and believe with Col. Grey that autumn is the best period for sowing seed. But we have never heard of any tangible results arising from sowing seeds of hardy terrestrial Orchids and our efforts have so far been unsuccessful even when sown near established plants. The raising of Fritillaries from seed is certainly to be recommended because experience has taught us that even slightly mutilated corms will prove complete failures.

Yet Col. Grey might have given more space to cultivation, especially under glass, and communicated some of his secrets, even if he had to condense somewhere else.

He deplores the comparative lack of interest in Crocus species, but if he desires new recruits he should explain methods of cultivation and make it easy for them to join the ranks. For instance Crocus and Colchicum, botanically different, are yet superficially near each other. Crocus pots must be plunged,

covered with plunging material and kept moist for several months, to stimulate root before top growth. Colchicum need not be covered and may be kept comparatively dry until leaves appear (i.e. after flowering). But let us settle here once for all the spelling of the Crocus named after Tomasini. Mr. Bowles, in his delightful book on Crocus, states it should have one "m" and we gladly accept his dictum. (We consulted three reference books and found three different spellings.) Of small consequence are statements that certain species like *Crocus Danfordiae* and *Iris Kerneriana* are not in cultivation, but they have been introduced by Balls.

Proof reading appears to have been well done, and though we have seen a few slips, the book appears to be on the whole singularly free from mistakes. Col. Grey's important work should find a place on every gardener's bookshelf next to the volumes of Bean and Farrer.

P. ROSENHEIM.

"Mountains of the Moon." By Patrick M. Synge. 8vo. 221 pp. (Lindsay Drummond, London, 1937.) 15*s*.

The scenic setting of the travels described in this book is so fantastic and singular that it seems almost incredible. However, the fine photographic illustrations provide convincing evidence that the seemingly grotesque absurdities of plant form and climatic contrarieties are neither imaginary nor even exaggerated, but actual features of "the most monstrous and unearthly landscape," as the author calls it in the Introduction.

Equatorial snow and the glacier of Weismann Peak at 15,000 feet on Ruwenzori, though surprising facts to believe in, seem quite ordinary compared with the Tree Groundsels 20 feet in height, giant Lobelias with rosettes that vie in beauty of handsome leaves with the finest Yuccas—eventually thrusting up spires, campanili or pagodas formed of countless flowers to a height of 29 feet; brilliantly coloured sun-birds, black and white crows, and a small mammal, the Rock Hyrax, a relative of the Coney of the Bible, with a deplorable habit of indulging in nocturnal screeching; all of which combine to make us exclaim with the telescopically expanding Alice in Wonderland, "Curiouser and curiouser!"

Again, can anyone well read in Edward Lear's nonsense story of the travelling children look at the Senecio of Mt. Elgon, as shown in Plate 52, without thinking of the co-operative Cauliflower? Some Senecios are clothed all in white, with a short, thick, silvery indumentum, and others are more thickly covered, "as if they had put on a thick shaggy fur coat over their leaves." The group of these groundsels shown in silhouette against the sky in Plate 51, aptly termed "Vegetable Ghosts," ought to belong to the land of dreams.

The wild Bananas, judging from Plate 5, have the most stately and lengthy entire leaves imaginable. Being over 6 feet long and remaining untorn, they provide the youth of the land with toboggans on the hillside, but a serious dilemma for the botanist who wishes to preserve one for the herbarium.

Then there is Lake Kioga in Uganda, where whale-headed storks and the Goliath heron, pelicans and black and white kingfishers spend their lives among blue Water Lilies and Papyrus; and again, Lake Nakaru in Kenya, where flamingoes made a pink fringe to the lake, and when disturbed rose in a glorious cloud, so that the sky became pink instead of blue. It reads like the scenery of a Drury Lane pantomime, including the gardens of ogres and magicians and the transformation scene.

For all that it is a delightfully written, sober account of a scientific expedition. The author's botanical training enables him to describe accurately, as well as pictorially, the wonderful plants he saw, many of which he has successfully introduced to cultivation.

One of the most beautiful is *Canarina Eminis* from Mt. Elgon, named in honour of Emin Pasha. It grows as an epiphyte in mossy crutches of trees. Its pendulous habit and large orange bells with white clappers make it a desirable summer-flowering plant for a stone vase. It seems very amenable, as it can be dried off like a Dahlia, and will start into growth in a frost-free greenhouse whenever water is supplied to it.

The artist, Mr. Somerville, who accompanied the expedition, provides two coloured and many collotype plates—for the most part weird and wonderful. Some suggest the work of cave-dwelling man drawing with a charred stick on a rock wall before canvas, paper or brushes were invented. Were it not for the excellent photographs and the charmingly straightforward, simple style of the skilful author, we might have been misled by the modern impressionism of the artist to think of the Mountains of the Moon not only as unreal but an ugly flight of imagination—not a dream of fancy but a nightmare.

" Cacti : a Gardener's Handbook for their Identification and Cultivation." By Professor J. Borg, M.A., M.D. 419 pp. 46 plates. (Macmillan, London, 1937.) 21*s*.

One of the difficulties encountered by growers of Cacti is that of naming their plants ; the number of known species approaches 2,000, and at least two-thirds of these are, or have been, in cultivation. The most complete work on the subject is the great Monograph by Britton and Rose, published in 1923 ; this has been almost unobtainable for some years and, though the American Cactus Society has now been able to reprint it, the size of the work (four volumes), its cost and its somewhat technical character, make it unsuitable for the beginner with no botanical knowledge.

But an enumeration of the plants likely to be found in cultivation with their descriptions was badly wanted, and now it has been provided by Prof. J. Borg in his excellent book " Cacti." The main part of the book consists of a classification, in which each genus and some 1,187 species are described in simple non-technical language in a very adequate manner. The system followed is that of Britton and Rose, with the addition of most of the new genera described since the publication of their work ; a few which are still regarded as controversial have been omitted. Reference is made to the new system of classification proposed by Curt Backeberg, but whilst agreeing that this has much to recommend it, the author has wisely decided that the time is not yet ripe for its whole-hearted adoption. It seems ungrateful to want more when so much has been given, but the provision of keys, to the genera at least, would have made matters a little easier for the novice, who only knows that Echinocactus, as defined by Schumann, has been separated into a large number of genera, and would like to know how and why. Ninety-two well-reproduced illustrations (in 46 plates) add much to the usefulness of the book.

In preliminary chapters the author deals with the structure of Cacti and their occurrence, with useful advice on cultivation. Prof. Borg lives in Malta, which offers a more congenial climate than this country for Cactus growing ; this should be borne in mind, though he himself has not forgotten that many of his readers will have to think in terms of a more northerly clime. The Summary of Cultural Hints at the end of the book, in which the requirements of the various species are considered under Tribe and Sub-Tribe, should be most helpful ; such reasoned and detailed directions as to the special requirements of Cacti from different districts and environments have seldom been given.

Some reviewers seem to think they will be suspected of not having read the book carefully unless they can pick holes ; in this case it is with genuine regret that I mention two points. Prof. Borg probably thinks of temperatures in degrees centigrade. In this country and in America we do not ; how many people would know whether to be alarmed or not on hearing that their own temperature was 36.6° C. ? A table of comparative temperatures in Centigrade and Fahrenheit as an appendix would be very helpful.

And the second point is the spelling of the specific names ; Prof. Borg says that he is following the American method, but he seems actually to be compromising ; in America a small letter is used for all specific names whatever their derivation, whilst under the International Rules (which incidentally are followed by many American botanists) specifics derived from the names of persons are written with a capital initial letter ; but Prof. Borg writes *Echinocereus poselgerianus* and *Wilcoxia Poselgeri*, whereas in America both the specific names would be given small initial letters, and under International Rules both would have capitals. The author seems a little undecided also whether to put the scientific names in italics or not. These may be small points, but it is confusing for the gardener, who likes to be as accurate as he can under difficult circumstances.

Apart from such minor points, the book is excellent in conception and execution and should be in the library of everyone who takes Cactus-growing at all seriously.

VERA HIGGINS.

" General Plant Physiology." By E. C. Barton Wright, M.Sc. 8vo. 515 pp. (Williams & Norgate, London, 1937.) 15*s*.

In the author's note it is stated that " The text is meant for first and second year University students. It does not pretend to give the most recent information on any one particular branch." The author has made a wide survey, and has classified his material into three major divisions, viz. : the physiology of the cell, metabolism, growth and reproduction.

To obtain precise information, the reactions and life of the plant are considered under controlled conditions of the laboratory rather than in the field

or garden. This precludes many physiological studies of ecological and horticultural interest, and the study of the interaction of species, individuals, and communities.

The chapters consist of introductory paragraphs dealing with early investigations, followed by a review of the progress made during this century. Despite the disclaimer that the text does not pretend to be up to date, many recent papers have come under review. Theory and fact are interwoven in the story, but are not muddled together, and a judicial scientific attitude is maintained throughout.

Topics of horticultural interest will be found in the chapters dealing with the ascent of sap, and the water relationships of plants; the respiratory changes accompanied by the biochemical processes of maturation and senescence during the storage of fruits (work which formed the basis of modern methods of gas storage); and the controversial topic of non-symbiotic germination in Ericaceous and Orchidaceous plants. The nutrition of the plant in relation to the mineral elements obtained from the soil and from fertilizers and manures is dealt with in a very short chapter on the ash constituents.

A knowledge of morphology and of organic chemistry is naturally assumed, but general readers may be unable to follow the chemical synthesis set out in the chapters dealing with respiration and the metabolism of nitrogenous compounds. In such a theoretical text practical details of how the reactions may be brought about by the biochemist are not usually given.

The text reads easily, but a few slight alterations might be advantageously made in a subsequent edition. On p. 43 one reads "the rate of respiration rose to 100 per cent. of its former value" (there is no mention of any previous decrease in the rate); on p. 100 "the order of toxicity is different for different degrees of toxicity"; on p. 109 "Bayliss objected to the use of the words . . . 'temperature,'" a slip for "heat" as quoted in the definition. There is an error on p. 112, footnote, "Annals Botany, 1639." On p. 195 the table quoted does not show the units used to measure assimilation—"mgs. per hour"; on p. 204 the unit is not shown, "gms. per sq. dm. per hour"; again on p. 354 respiration was measured in "gms." The first year student has little idea of the magnitude of the processes, and these units should be stated clearly. On p. 451 and in the index *Cosmos sulphureus* is misspelt; on p. 106 one reads "It seems to be a point of honour amongst investigators to increase the already large number of theories"; on p. 311 "Some [elements] have several activities thrust upon them, *e.g.* potassium which is somewhat of a Pooh Bah in this respect"; on p. 403 "reminiscent of the emperor's dress clothes." The appreciation of these remarks will not be universal.

There is an adequate bibliography showing the source of much of the subject-matter, and numerous references to original papers; an index of authors is provided, as well as a subject index. Many of the illustrations are reproduced from other texts.

"Phytohormones." By F. W. Went, Ph.D., and K. V. Thimann, Ph.D. 8vo. 294 pp. (Macmillan, New York, 1937.) 15*s*.

This book reviews the development of the idea that correlations in plant growth are due to the influence of special substances. The authors confine their attention to the higher plants, and thus the subject-matter will be of particular interest to horticulturists.

They adhere to the definition of a hormone as "A substance which being produced in any one part of the organism is transferred to another part, and there influences a specific physiological process" (Bayliss and Starling, 1904). They trace out the historical progress made by many investigators concerned with cognate problems of growth, tropisms, and differentiation. Very few papers have escaped their notice and careful scrutiny, so that the text bristles with references and dates.

A distinguished son of an eminent father, to whose memory and that of H. E. Dolk this book is dedicated, Dr. Went and his co-author have been for many years active leaders in this field of research. The Utrecht school of plant physiologists and biochemists, following the work of Boysen Jenson in Copenhagen, whose book appeared a year or so ago, played a most important part in comparably recent discoveries. To Kögl and his associated workers we owe the isolation and chemical determination of the structure of auxin *a* and *b*, followed by the recognition of the activity of hetero-auxin or indolyl acetic acid.

This latter discovery has opened up such a rich mine for exploration that the rush of pioneers has not shown signs of abating; occasionally this has led to a desire to stake a claim with undue haste and bustle. Therefore we owe a

debt of gratitude to the authors for their review of the progress made, which is both critical and dignified.

It is perhaps yet too early to formulate a final and valid opinion as to the applicability of the related growth substances to horticultural practice, but many promising results have been obtained in propagation, where the hormone-like substances may be of much use in accelerating the development of roots from cuttings of species known to be fairly difficult to root otherwise. With species of great difficulty less success has been obtained, but in general nursery routine many favourable results have been observed by practical men competent to judge the methods by the tally of their daily routine.

The chemical firms and business houses have quickly exploited the physiological results, so that ready supplies of the growth substances are now available. It may be that in the future we may learn to apply these active organic substances to the growing plant so that we can favourably influence growth and development.

The authors have prepared a bibliography of many titles, which covers thirty-two pages and is of much value to the research worker.

M. A. H. TINCKER.

"British Grasses and their Employment in Agriculture." By S. F. Armstrong. Ed. 3. 8vo. xi + 350 pp. (University Press, Cambridge, 1937.) 15*s*.

This book is already so well known that it will suffice to draw attention to the new edition in which Part II, dealing with the use of grass in agriculture, occupying more than half of it, has been rewritten. The need for this is evident in view of the amount of research that has been carried out since the book first appeared twenty years ago. A chapter on the formation and upkeep of lawns and greens is included.

"Farm and Garden Seeds." By S. P. Mercer. 8vo. xii + 205 pp. (Crosby Lockwood, London, 1938.) 10*s*. 6*d*.

This book deals with the Nature of the Seed, Commercial Seed Production, Seed Testing, Crop and Weed Seeds, and with the Seeds Act, the last part being written by Mr. A. W. Monro.

It is well illustrated with many figures of seeds.

The title of the section Commercial Seed Production may be misleading, for it deals with the cleaning, storage and carriage of seeds, not with the cultivation and treatment of the parent plants to obtain seed of good quality.

Here and there one feels that the attempt at picturesque writing is misplaced in a book of this type. What, for instance, is one to understand by the "north end" of a seed?

"Lenné, Peter Josef, und seine bedeutendensten Schöpfungen in Berlin und Potsdam." By Gerhard Hinz. 8vo. 214 pp. Frontispiece and 70 text figs. (Deutscher Kunstverlag, Berlin, 1937.) R.M.12.

This is an account of the life and work of the German landscape gardener P. J. Lenné (1789–1866), a follower of Pückler-Muskau in the introduction of the English "natural" or "landscape" style into German garden design. Lenné was for many years director of the Royal Park at Sans-Souci, Potsdam, which, together with various other parks and places in Berlin and elsewhere in north Germany, was in large part laid out by him. Of these many plans and detailed historical accounts are given. The work thus forms an important chapter in the history of landscape gardening in Germany.

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FORTHCOMING EVENTS.

WE have great pleasure in announcing that Sir WILLIAM WRIGHT SMITH, M.A., F.R.S.E., F.L.S., V.M.H., of the Royal Botanic Garden, Edinburgh, has kindly consented to become the Society's Honorary Professor of Botany in place of the late Dr. RENDLE.

The two principal events of this year, the Conference on Flowering Trees and Shrubs (other than Rhododendrons), and the Chelsea Flower Show are past.

It will be noted that there is no Great Autumn Show at Olympia this year owing to the impossibility of securing suitable accommodation. The next Autumn Show will be held in 1939. We have therefore now to look forward to the regular Fortnightly Shows interspersed with the Shows of Kindred Societies.

In the New Hall the usual Fortnightly Meeting will take place on June 8 (12 noon to 7.30 P.M.) and June 9 (10 A.M. to 5 P.M.). On June 8, at 3.30 P.M. Mr. G. P. BAKER, V.M.H., will lecture on "Irises for Beginners," and on June 9, also at 3.30 P.M., Lady ALLEN OF HURTWOOD, F.I.L.A., will lecture on "The Future of Landscape Architecture in England." This lecture is arranged by the Institute of Landscape Architects.

In the New Hall on June 16 (1–7.30 P.M.) will be held the Show of the British Delphinium Society. This Show was originally fixed for June 30, but owing to the weather conditions the date has been altered.

In the New Hall, on June 21 (12 noon to 7.30 P.M.) and June 22 (10 A.M. to 5 P.M.), the regular Fortnightly Show will be held, and at this show the exhibits of the London and South of England Viola and Pansy Society will also be seen.

There will be a Shrub competition for amateurs on this occasion, particulars of which were given in the May number of the JOURNAL and are here repeated :—

Class A.—8 varieties of hardy shrubs in bloom, not more than 2 of any one genus.

Class B.—1 vase of a hardy shrub in bloom.

Entry forms to be obtained from the Secretary of the Society.

On the same dates and times the Cactus and Succulent Society will hold its Show in the Old Hall.

On June 21 at 3.30 P.M., in the Lecture room of the New Hall, Mr. E. A. BUNYARD will give a talk on the interesting subject " Old-fashioned Roses."

The first Fortnightly Show of July will be on July 5 (12 noon to 7.30 P.M.) and July 6 (10 A.M. to 5 P.M.), at which Lilies will probably predominate. The following classes for Lilies for Amateurs will be open for competition :

Class A.—6 species and/or hybrids of Lilium, 1 stem of each, cut or on plant.

Class B.—1 stem of Lilium, cut or on plant.

Entry forms are obtainable from the Secretary.

At the Show on July 5 and 6 and July 19 and 20 a Banksian Medal is likewise offered for award to the amateur who exhibits, at either one of the Shows mentioned, the best hybrid Lily which has not received a Certificate of Preliminary Commendation, an Award of Merit, or a First-class Certificate beforehand. Entries for this Medal must be made on forms obtainable from the Secretary, by whom the completed forms should be received not later than by the first post on the morning of the Show, but earlier if possible.

In the Old Hall on July 5 (1 to 7.30 P.M.) the National Sweet Pea Society will hold their Show.

At 3.30 P.M. on July 5 in the Lecture Room of the New Hall there will be a discussion on " The Lilies Exhibited." Members of the Lily Group are invited to attend. The further arrangements for the Lily Group are given later.

On July 12 (1 to 7.30 P.M.) and July 13 (10 A.M. to 5 P.M.) the National Carnation and Picotee Society will hold their annual Show in the Old Hall.

On July 19 (12 noon to 7.30 P.M.) and July 20 (10 A.M. to 5 P.M.) there will be a Fortnightly Show at which there will be two competitions ; the first, a Lily Competition for amateurs for one stem of Lilium, cut or on plant ; the second, the annual competition for the Clay Challenge Cup for the best-scented Rose. The particulars of the latter competition will be found on page 32 of the January JOURNAL and entry forms are obtainable from the Secretary.

At 3.30 P.M. in the afternoon of July 19 Mr. D. B. CRANE will speak on " Violas and Pansies " in the Lecture Room of the New Hall.

At Wisley there will be a demonstration on the Summer Pruning of Fruit Trees and Shrubs (weather permitting) on July 20 and July 21 from 2 to 4 P.M. Fellows should inform the Director of the Gardens of their intention to attend.

LILY GROUP.

Besides the discussion on July 5 mentioned above, the Lily Group will hold a meeting on June 21 at 4.30 P.M., in the Restaurant of the Old Hall, when a discussion on "The Arrangement of Lilies in the Garden" will take place.

On July 2 visits will be made to the Gardens of Colonel STEPHENSON R. CLARKE, C.B., LL.D., V.M.H., at Borde Hill, Haywards Heath, Sussex, and the Hon. Mrs. PAULINE SPENDER-CLAY, at Ford Manor, Lingfield, Surrey.

In the evening of July 5 at 7 o'clock a dinner will be arranged for the members of the Lily Group and their friends, and after dinner a discussion will take place. Particulars of the visits and of the dinner are obtainable from the Secretary.

COLORADO BEETLE.

The Minister of Agriculture asks that notice may be drawn to the Colorado Beetle.

There is an increasing danger of the Colorado Beetle reaching this country by flight or other means in consequence of the further spread of the pest on the Continent, where the greater part of France, and a large area in Belgium are now infested; outbreaks have also occurred in Germany, Luxemburg, Switzerland and Holland.

The Ministry of Agriculture is accordingly anxious to obtain as early notification as possible of the discovery of the pest in this country.

Any yellowish beetle with black stripes or any red or reddish-yellow grub that is found feeding upon potato leaves should be regarded with suspicion. When suspected Colorado Beetles or grubs are discovered, specimens should be placed in a tin box (in which no holes should be punched) with a piece of potato leaf, and the box should be sent to the Ministry of Agriculture, 10 Whitehall Place, London, S.W. 1, with a letter stating the exact place where the insects were caught and the name and address of the finder.

HALL LETTINGS.

A Bazaar will be held in the Old Hall on June 28 and 29 in aid of the Westminster Institute.

WISLEY IN JUNE.

Amongst the trials and standard collections situated chiefly on the hillside not far from the entrance gates, Delphiniums, Lupins, Sidalceas, Roses, Irises, and Hemerocallis (below the herbaceous border) will all be

in bloom this month. The Delphiniums having this year been transplanted there is in consequence likely to be a smaller show of flowers. The Irises, however, are particularly promising, and many fresh plantings of the most vigorous varieties of Roses have been made in the borders along King's Avenue on the hillside.

Beside the Alpine House is a comprehensive collection of the species of Cistus, so useful on soils of a sandy nature, and others of the race will also be found at the further (northern) end of Howard's Field, together with examples of the closely related Halimiums and the hybrid Halimiocistus. The Helianthemums are also represented in both these parts of the Gardens, being used as an effective edging to the borders of shrubs in the latter section. Within the protection afforded by the Alpine House the various species and hybrids of Campanula, Lewisia, and Saxifrages of the *Saxifraga Cotyledon* type should be in full bloom, the long arching sprays of the last-mentioned making a very decorative feature. Other plants to be seen here are *Phlox mesoleuca, Phyteuma comosum, Nierembergia caerulea,* the rare Japanese shrub *Tsusiophyllum Tanakae,* and *Weldenia candida,* a native of Mexico.

Passing down to the rock garden visitors will find many more suitable plants flowering, including species of Primula, Dianthus, Hypericum, Geranium, Linum, Meconopsis, *Phlox adsurgens,* Nomocharis, Ramondia, and *Erica umbellata,* while on the Alpine Meadow is the dwarf *Hemerocallis nana,* and by the side of the ponds the showy Japanese *Iris Kaempferi* in hues of purple. Other species of Iris and hybrids of *Iris sibirica* grow below the old Apple trees beside the path from Seven Acres to the glasshouses.

The Primulas which appreciate cool shady situations, of which *Primula japonica, P. helodoxa, P. pulverulenta* and its hybrids and pink form are among the chief, now form large patches of colour in the Wild Garden below the Oak trees, where also grow the Lilies and *Meconopsis betonicifolia.* The earliest of the Lilies to flower are the soft yellow *Lilium pyrenaicum* and *L. Szovitsianum,* both of the Martagon section.

Another interesting plant on the side of one of the ditches is *Orchis foliosa,* native of Madeira, having dense spikes of bright purple flowers. The prettiest of the shrubs here is probably the N. American *Kalmia latifolia* in pale pink, but the sweet-scented *Magnolia Watsonii* and *Zenobia pulverulenta* with clusters of pendent white cups are almost equally charming.

There are, however, many other kinds of shrubs to be found in bloom in Seven Acres and Howard's Field ; this furthermost part of the garden should not be overlooked by visitors to Wisley. In Seven Acres the Berberis, Philadelphus, Escallonias, Spiraeas, *Cornus Kousa* and *Buddleia alternifolia,* with *Genista cinerea* and *G. aethnensis* in the Heath Garden must be mentioned. In Howard's Field beyond the Pinetum are many varieties of old Roses and Rosa species planted beside the path along the river bank, and to both of these groups many



FIG. 57.—ESCALLONIA MONTEVIDENSIS AT BORDE HILL.

[*To face p.* 256.



FIG. 58.—TECOMA 'MME. GALEN' AT BORDE HILL.

additions have been made during the past planting season. Features in the Award of Merit Garden include that handsome late-flowering Broom *Genista virgata*, the double white *Deutzia scabra* and near by the less vigorous but more graceful *D. Monbeigii*, *Philadelphus* 'Virginal,' and pale pink *Cistus* 'Silver Pink,' of low habit, most suited to a sunny position in the rock garden. Near here also is the Viburnum collection in the north corner of the Azalea Garden, which may be seen on the way to the herbaceous border, although at this early date there are not likely to be a great many plants actually in flower there.

A splash of rich colour in the large Temperate house is made by the Australian Bottle-Brush (*Callistemon citrinus splendens*), where also grow *Strelitzia Reginae* with its peculiar crested inflorescence in blue and orange, Fuchsia species, the Oleander, and *Datura suaveolens* with huge double white trumpets. Interesting plants of smaller size in the Half-Hardy house are the pink-flowered shrubby *Ebenus cretica*; the creeping *Lotus Bertholetii* with grey foliage and vermilion claw-like blooms; the climbers *Loasa lateritia*, *Lathyrus Bartonianus* and *Mutisia decurrens*, *Pentstemon antirrhinoides* from California, with scented yellow flowers and a tall shrubby habit; and finally that dwarf but showy succulent from South Africa, *Rochea coccinea*, bearing tight heads of vivid red, rather fleshy flowers.

Rhododendron Conference.

Owing to the severity of the weather this spring causing widespread damage to the Rhododendron plants, it has been decided to postpone the Conference on Rhododendrons that was to have been held in 1939 to 1940.

THE GARDEN AT BORDE HILL.

By Col. STEPHENSON R. CLARKE, C.B., LL.D., V.M.H.

I HAVE been invited by the Editor to write an account of the garden at Borde Hill for the JOURNAL of the Royal Horticultural Society, and I trust that the universal adoration he receives from its Fellows will in no way be impaired by the first act of rashness that I have known him to commit.

I have already moved (in spirit) towards the front door where I await the arrival of my readers. While waiting, one thought after another passes through my mind—the first one is that my oldest and best-beloved garden friend told my wife that after fifty years study of my character and disposition he thought that I did not really care for flowers. I know that he was wrong, I hope you all know that he was wrong, but it is a bad beginning ; it gives me an inferiority complex at a moment when I require courage, possibly bravado.

At Borde Hill the front door is on the north side of the house and the land beyond falls gently to the Ouse, and beyond that it rises more steeply to the Balcombe ridge ; west of due north is the narrow, well-wooded valley along which the railroad passes to Balcombe Station ; to the north-east the view is wider and more extensive towards the dark line where the high ground of Ashdown forest bounds the horizon, some nine miles away. The woods are so numerous that intervening fields and even houses are not seen ; many of these woods I played in, and caught butterflies in as a child ; there seems but little alteration in them at first glance, but in reality, from a forestry point of view, there is a great deal. The oaks have benefited greatly by sixty years growth, few have been felled, and what was " Coppice with Standards," is now " High Forest " in many cases ; and there is a change, too, in their butterfly population. Sixty generations or more of hand-reared pheasants have exterminated the formerly large number of Fritillaries, whose caterpillars fed on the dog-violets along the rides ; but the cessation of coppice cutting has enabled honeysuckle, the host of the White Admiral, to thrive more luxuriantly, and this graceful butterfly, unknown to me as a child, is now abundant in many places. The Comma, too, has for reasons unknown to me, appeared in autumn, and is now an established and very welcome denizen of the woods and garden. It seems to have rather gregarious tastes, as when only three were present in the kitchen garden I saw all three sucking sociably at the same plum.

Perhaps this has been a digression, but I have indulged in it to show that to me a garden is not merely a convenient place to feast the eyes upon a parade of flowers, continually changing throughout the summer, but is also the centre of happy memories, where the enjoyment of the flowers near at hand is enhanced by frequent views over

a pleasant landscape. Views, unfortunately, cannot be obtained without breaking shelter belts and leaving openings between shrubberies, and this, naturally, is a detriment to the flowers, but I would in no case sacrifice the views, and I think enough shelter has been left for my horticultural purposes.

Time flies, and we have arrived, we will imagine, at the end of the third week in May, and I suggest making a start to see the garden, as the accusation of not liking flowers still rankles! We will go first to the Azalea ring where for certain we shall find plenty of blossom; this is reached by following the carriage drive right-handed for three hundred yards. As we go you will notice that the top of the ridge (where the house and the garden are placed) is level; the site is an ancient one—part of the house was built late in the sixteenth century—and I am assured that there were buildings there previously. There is no doubt that the site has been levelled at various times by removing the top soil, with the result that while the slopes of the park running up to the garden consist of loam of excellent quality the garden itself was composed, when I came here, of the clay subsoil, except for a narrow and irregular fringe along the northern and southern slopes; removal of this clay in many places, and bringing in more suitable soil, has been a slow business which has greatly impeded the development of the garden. The path for the Azalea ring (really a horse-shoe) leaves the carriage drive at a lower level than the garden flat, and here stood a fine, wild Service tree (*Sorbus torminalis*) which was sixty feet high, and eleven feet in girth at the smallest circumference, below its first branch. Some thirty years ago the trunk snapped at ground level and it fell; there was a large hole made when we grubbed the stump out, it was good loam to the bottom, yet a few yards forward the raw subsoil clay is close to the roots of the grass.

Thirty-five years ago this part of the garden was a paddock, where the children's ponies were turned out, divided from the road by a belt of trees; this belt was widened by planting in front of it Conifers (mostly Japanese Silver Firs raised from seed sent from Japan by a brother of mine in 1890) interspersed with Ghent Azaleas obtained from Van Houtte. The Conifers have all done well; *Abies brachyphylla* was fifty-seven feet high in 1932, and has grown considerably since; some plants of the Ghent Azaleas, now over forty years old, are twelve feet high, and make a brave show after the Knap Hill hybrids are past their best; the last were nearly all bought in bloom in company with the late Mr. ANTHONY WATERER, to whose Nursery I paid an annual visit for many years. They are planted on either side of a walk in front of the Ghents and range through white, lemon, buff and orange, to rich crimson, and there are also a few good pinks, but perhaps of all the colours, pure white is least common among them. On the outside of their beds are some *Rhododendron molle* and "Mollis hybrids"; these open the Azalea season by blooming before the Knap Hill Azaleas; the late Lord WAKEHURST, I believe, preferred the best Mollis to the Knap Hill hybrids, but

although I am a great admirer of the Mollis I undoubtedly prefer the Knap Hill strain. Once or twice we have tried to cross the best red Mollis with the best red from Knap Hill, but have failed to obtain seed.

Behind the Ghents is another path, on either side of it are large-leaved Rhododendrons and among them is *Rhododendron lacteum*, a valued present from Mr. J. C. WILLIAMS. I had cultivated it for over twenty years before it flowered, and then a truss from it took the first prize in the *lacteum* class at the Rhododendron Show. *R. lacteum* seems to be a genuine sun-hater as two other plants of this species were so long before forming flower buds that I moved them to a situation only partially shaded; here they formed flower buds, but died before these opened.

With the Azaleas, and as specimens on the lawn inside the horse-shoe, are various Conifers and flowering trees, among them a tree of what I used to call *Prunus Miqueliana*, which I estimate at thirty-five to forty years old; I understand that it is now regarded by Botanical authorities in Europe as a form of *P. subhirtella*, though I hear that the Japanese do not agree. It is not for me, happily, to express an opinion or to do anything except grow it; this is an easy task for it is perfectly hardy, and a good doer. Among the other trees are two *Cornus Mas*, the largest of which, twenty-five feet high six years ago, has grown considerably since, and is still in rude health. Another is an *Idesia polycarpa*, forty-eight years old; near them is a large *Prunus serrula*, with a polished bark, whose drooping flowers generally are too few in number for this Cherry to be reckoned among the many beautiful flowering trees of its family, but in 1938 it bloomed freely and was quite pretty; in fact, catching sight of it from a position where its bark was not visible I took it for a minute to be a Styrax. Styrax is represented near the Azaleas by a specimen of *Styrax langkongensis* and a tree of *S. hupehensis*, also another of *S. dasyantha*, all of which seem to be hardy; standard trees of the last appear to be rare in Great Britain. Of the five species of Styrax represented in the garden (*S. Obassia* and *S. japonica* in two forms are also here) it seems to me to be the least ornamental; the better form of *S. japonica* is a far more desirable tree than the type, being larger in flower and freer in growth, and possibly even hardier.

Before we leave the Azalea ring I would like to tell you of the Magnolias that I planted in the beds among the Azaleas; these approved of the soil and made good growth, but when the Azaleas closed in on them I had great troubles. I had flattered myself that the Azaleas could be moved and the Magnolias left in possession of the beds; the Azaleas moved all right, but some Magnolias resented the disturbance to their roots and in a few instances died and I lost some valuable plants. While I should not trust any Magnolia to endure pleasantly such interference, I have found *Magnolia hypoleuca* especially touchy, and its dislike of disturbance extends in some cases to death after the amputation of a large branch.



FIG. 59.—LILIUM GIGANTEUM AT BORDE HILL.

[*To face p.* 260.

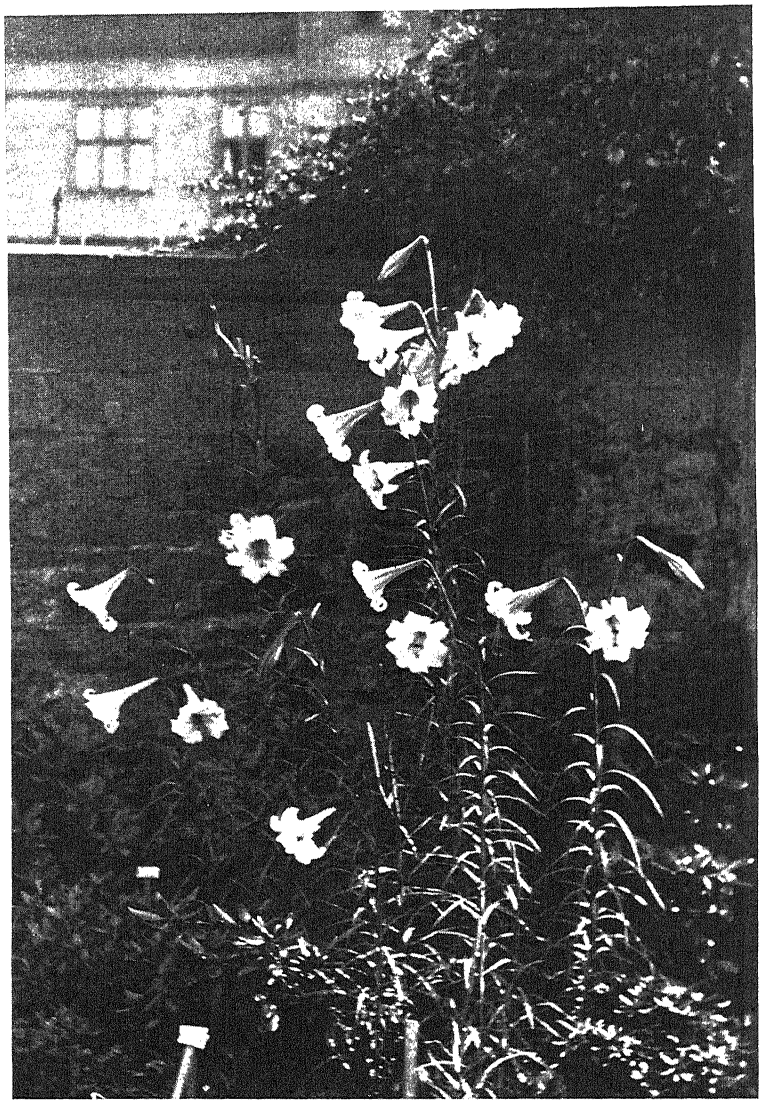


FIG. 60.—LILIES AT BORDE HILL.

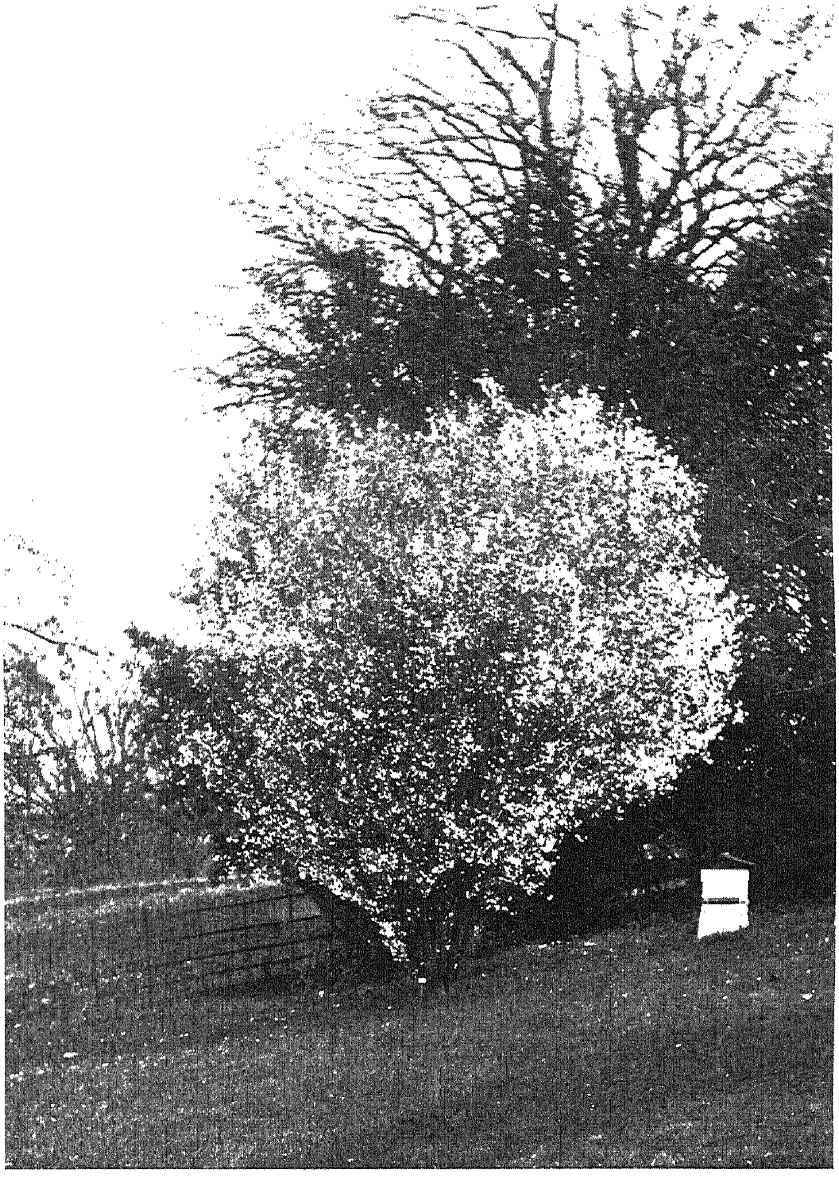


FIG. 61.—PRUNUS INCISA AT BORDE HILL.



FIG. 62.—MAGNOLIA SALICIFOLIA, COLUMNAR FORM, AT BORDE HILL.

[*To face p.* 261.

We have pretty well exhausted the Azalea beds and their inmates. If we cross the carriage drive again to the southern slope we shall arrive at the Kitchen Garden; the wall round it was built in 1906, outside the wall are beds, their soil is somewhat heavy, but it appears to suit Magnolias. Facing east on the outside is a tree of *M. Delavayi* now twenty-five years old; planted originally against the wall its branches are well above it. Its comrade, planted in an open bed, only lived two or three years. A plant of *M. nitida* kindly given to me by Major GEORGE JOHNSTONE about five years ago, placed in a similar position has flourished, but I have lost two other young plants of this species. One apparently found a position on a south wall too hot and dry, the third in a somewhat limy bed in the Isle of Wight became unhealthy and quickly perished. I have never heard whether this species is a lime-hater or not; other Magnolias in beds farther away from the wall are *M. Soulangeana rustica rubra*, a well-known and very charming hybrid. I am inclined to think that the colour of its flowers is more vivid in some soils than others; here I have no cause to complain of it. *M. Veitchii* (a marvellous grower), *M. stellata*, and *M. stellata rosea*, a weaker grower than the type, which also takes longer to establish; and *M. Campbellii* on the west side of the Kitchen Garden. When this last tree had been planted for about twenty years it bloomed and it did so most years for five or six seasons; then I thought it was not looking well and I gave it a heavy top-dressing of manure. Following on this it did nothing in the flowering way for three or four years; this year, however, it is starting to bloom again but with only two or three buds. It will be a long time before it receives any more manure, and that's that!

Other trees near and south of the wall which are perhaps noteworthy are *Stewartia sinensis*, remarkable for its coloured bark; *S. Malacodendron* (*virginica*), a species which seems to like a bed of sandy peat, and whose flowers are finer by far than those of *S. sinensis*; *Lindera megalophylla*, a hardy evergreen planted in 1913 and now about thirty feet high; *Rhus verniciflua*; *Corylus chinensis*; *Gordonia Altamaha* (which has not yet flowered); and *Eucalyptus coccifera*. On the inside of the kitchen garden wall facing north are several big bushes of *Camellia reticulata*, a confirmed sun-hater. I tried this Camellia in four stations, but it never throve until it was placed on this north wall.

Moving back towards the lawn before reaching the carriage drive we pass a large bush of *Quercus alnifolia*. This has the yellow undersides to its particularly hard leaves very pronounced; it was a great favourite of the late Dr. AUGUSTINE HENRY. Near it is a good specimen of *Q. coccifera* (type I believe) though it came as, and is labelled var. *calliprinos*. I remember in 1886, when shooting woodcock on a mountain in Asia Minor, that the leaves of the scrub oaks, under which the birds were hiding, were distinctly glaucous; I presume that they were var. *calliprinos*. I do not recollect seeing more than one tree of the Kermes Oak with leaves of this colour in England. This is at

Osborne ; its leaves are also larger than those of the trees at Borde Hill. I have very kindly been given acorns from it which proved fertile, so I hope that this variety (which some think to be a distinct species) is now here.

Moving up the carriage drive and taking a path on the left we reach what was a small orchard. Many years ago its Apple trees died ; I wondered from what cause, and now I fear that it was honey fungus. I trust my suspicion is unfounded for before I formed it I had planted here many favourite trees, especially Magnolias ; amongst these are *Magnolia Sargentiana*, now in bud ; *M. globosa* ; *M. Kobus borealis* ; *M. macrophylla* ; *M. Dawsonia* ; *M. sinensis* ; and the columnar form of *M. salicifolia* (fig. 62). On the outskirts are a bed of *M. stellata* and a large plant of a particularly poor form of *M. Wilsonii*. A large bush of *Stewartia Pseudocamellia* died here suddenly two years ago, and I feared that an epidemic of honey fungus was to be expected, but so far there have been no further cases, and its allies *S. serrata* (a very free-flowering shrub) and *S. pentagyna* are in good health. There are also several old bushes of Rhododendrons near them ; among them two beds have found admirers, one of blue *Rhododendron Augustinii* and one of *R. campylocarpum pallidum* ; both beds are nearly pure peat, and I think that the fine colour of the *R. Augustinii* has been influenced by this ; I feel sure that this variety of *R. campylocarpum* likes peat too, and as it will flower in the shade I find it a very easy Rhododendron to grow ; of four or five strains of *R. campylocarpum* which I have tried here, the one I believed to be Hooker's original introduction is the most difficult to grow well ; it refuses to flower in the shade and becomes shabby and often dies back in the sun. I recollect seeing a very old and large plant of it in the open park at Beaufort Castle, Beauly, Inverness-shire, which was quite the best specimen of it that I have seen, so I presume that it likes its sunshine, but " drawn mild."

The path branches here, the right-hand portion passing through a gate into what was originally the kitchen garden, and is now, except for a pergola of cordon Pears and a few fruit bushes, under glass houses and ash-yards ; there are, however, a few small bays at the top mostly given over to Daffodils ; and two herbaceous borders. At the entrance gate there is a tree of *Catalpa Duclouxii* raised from seed kindly given to me by Mr. CHARLES ELEY. It is very beautiful in early summer when carrying its handsome rosy panicles of flowers, and very interesting later when it is draped with its three-feet long pods, whose diameter is about equal to that of a French Bean. Another Chinese shrub here is a huge plant of *Viburnum rhytidophyllum* ; unfortunately it has no mate, and we never see berries on it.

After passing through the old kitchen garden the path goes through the little Rose garden to the house ; on the wall of the Rose garden facing north are shrubs of *Rhododendron stamineum*, *R.* × *fragrantissimum*, *R. Lyi*, and of *Camellia saluenensis*, also its hybrid, with *reticulata*, *C.* × 'Salutation,' which was raised here and honoured

with an **A.M.** by the Royal Horticultural Society. A good deal of the Rose garden is occupied by old trees of the Japanese Cherries ' Kirin ' and ' Oku Miyako ' on the north of the centre path, very floriferous and beautiful in May, and on the south side of it by a *Cercis racemosa* and a *Prunus subhirtella pendula* ; both these trees have grown rapidly and are in vigorous health, but I think them poor varieties of these beautiful species. The natural result of the competition of cherry trees, etc., and of the lack of free circulation of air caused by the wall, is that our roses do not thrive as well as we should wish.

The left-hand branch of the path passes beds of Rhododendrons before reaching the lawn, and can be followed along the top of the ha-ha ; on either flank of the lawn are numerous beds of dwarf Rhododendrons, those on the flat on the east side are largely occupied by ' Lapponicums,' and the method of cultivation adopted was to layer as many shoots as could be handled, to see that no beds were overhung by trees, to give plenty of water in the summer, and to break the force of the southerly gales by a line of hop-netting in the winter. This is removed when the weather improves in April. The results appear more satisfactory than have been obtained on the west side, but many of the beds there are on slopes and I find in such beds (especially when the surrounding soil is stiff clay) that it seems difficult to give sufficient watering to the upper half of the bed or sufficient drainage to the lower half ; banks facing north are easier to manage, but even with this aspect they may be too steep ; the above-mentioned beds face east. The stiffness of the surrounding clay is due to the top of the hill here, to the depth of several feet, having been removed during the great frost of 1895 to reveal the view south to the windows of the ground floor of the house.

The ground west of the lawn contains a small terrace garden with low walls, and a small rock garden ; the walls were planted with rock plants, and at first these did very well, but mice formed runs between the " courses " of stones behind the plants, and air was admitted to the back of their roots with disheartening results ; possibly another time it would be worth while to interrupt the space between the " courses " with pieces of slate or even with powdered glass.

To the north of the rock beds is a large pit, probably formerly a quarry from which part of the sandstone was brought to the house when it was first built in 1598 ; some large-leaved Rhododendrons in the pit are doing well, among them two varieties of *R. sinogrande*, the form first introduced, and var. *septentrionale*. Both seem hardy, but whereas the first form holds its leaves in their natural position during a frost, *septentrionale* under such conditions droops its leaves until they hang parallel with the stem. East of this pit is the estate office, and around it are beds containing thirty-year-old plants of Rhododendrons, mostly *Griffithianum* hybrids, and hybrids of *R. Thomsonii* and *R. barbatum* ; among these are a few species, one of which originally planted as *R. assamicum*, and which I am now told should be called *R. iteophyllum*, has surprised me by being hardy.

South of the estate office is a line of *Eucalyptus Gunnii*; the westernmost tree is a handsome specimen; its age is doubtful, but it is several years younger than one between the Rose garden and the house, which was planted in 1895 and is eight feet in girth.

Leaving the estate office for the carriage drive we pass the east end of a glade between bushes of *Rhododendron ponticum* and Laurels. There are narrow beds on either side of it, the northern one planted with Rhododendrons of the Irroratum series, and the southern one mostly with large-leaved species. Probably these beds are less troubled by frost than any in the garden; even *R. Kyawi* and *R. giganteum* seem to be rarely molested by it in them.

I have found at Borde Hill that the large-leaved Rhododendrons are much less affected by drought than I had expected, and except *R. giganteum* and/or *R. protistum* (I must confess that I cannot tell them apart) I have never seen any of them injured by frost; but the (? two) species named often show frost marks and sometimes have been killed. Facing the east end of the glade is the house; the beds round it were made four feet deep and were filled with the turf from the lawn when this was lowered in 1895. On its west are Rhododendrons, including two fine 'crassums'; on its south a *Magnolia Soulangeana*, and two Camellias from my father's old garden at Croydon Lodge were planted. I think that they are now seventy-five years old, or nearly so, and quite robust. There is also an old Pomegranate and a *Magnolia compressa*, an interesting evergreen that is not easy to obtain, kindly given to me by Mr. J. G. MILLAIS.

On the east side of the house is a healthy plant of *Magnolia fuscata*; on the south side of the southern forecourt are large bushes of *Olearia avicenniaefolia*, *Itea ilicifolia* and various Abelias and other shrubs and climbers, among them *Mutisia decurrens*.

Leaving these beds and crossing the carriage drive we can pass through a gate in the low sandstone wall, the northern boundary of the forecourt, and we then see below us a new piece of garden recently reclaimed from the Park, the soil is excellent and no carting is required when making new beds; there is a pit, probably also an old quarry, at the west end; the side of it facing north has proved valuable for Lilies and Nomocharis. The various beds are filled with Chinese Rhododendrons too young to call for description; these beds trend to the north, which aspect in a normal year suits the Rhododendrons, but they received a serious set-back from the frost of May 17, 1935. Two rare Magnolias planted here are *M. Fraseri* and *M. officinalis*, the latter a much-appreciated present from Colonel MESSEL. From here it is but a few yards to the front door, and we have ended our round.



FIG. 63.—RHODODENDRON CALOPHYTUM AT BORDE HILL.



FIG. 64.—OSMANTHUS DELAVAYI AT BORDE HILL.

[*To face p.* 265.

CHRYSANTHEMUM RUBELLUM AND ITS ALLIES.

By J. R. SEALY, B.Sc.

IN an article published in the Gardeners' Chronicle for May 2, 1936,* it was pointed out that the Chrysanthemum which received an Award of Merit at the R.H.S. Autumn Show in 1935 under the name *Chrysanthemum erubescens* was wrongly named. It is not the true *C. erubescens* Stapf,† and it acquired this name through the mis-identification of incomplete material. A résumé of what was known concerning the history of the garden plant was given in the 1936 article, and as the complete history of the plant was not known there was then no direct evidence for connecting it with any described species. Nothing further has come to light on its history since the article was written, and we are still ignorant of the origin of the garden plant.

Investigation of the identity of the garden "*erubescens*" has shown that this plant cannot be referred to any known species, and a new name, *C. rubellum*, is therefore proposed for it. This investigation entailed a detailed consideration of the inter-relationships of the garden plant and three other species, *C. Zawadskii* Herbich, *C. sibiricum* (DC.) Forbes & Hemsley, and *C. erubescens* Stapf, with the result that, though the last-named was found to be quite distinct from the other species, *C. sibiricum* could not be maintained, and has to be reduced to *C. Zawadskii* as a variety. The evidence for these conclusions is given below.

I am indebted to Miss STELLA ROSS-CRAIG for the drawings (figs. 65 and 67), and to Mr. H. B. REDGROVE for the photograph (fig. 66).

1. *C. rubellum* (syn. *C. erubescens* Hort.) (fig. 66).—The garden "*erubescens*" cannot be identified with any known species of Chrysanthemum, but is evidently most closely allied to *C. Zawadskii* Herbich and *C. sibiricum* (DC.) Forbes and Hemsley. Of these two, the garden plant is nearer to *C. sibiricum*, but, as mentioned above, this species cannot be maintained and has to be reduced to *C. Zawadskii*, from which it differs only in having less narrowly dissected leaves, and to which it may be referred as a variety, var. *sibiricum*. From both *C. Zawadskii* and its var. *sibiricum*, the garden "*erubescens*" differs very markedly by its much greater stature, more luxuriant growth, larger and more coarsely cut leaves, and larger flowers. These differences might be attributed to the more favourable conditions under which the garden plant grows, but there are two facts which seem to show that the differences are something more than the result of cultivation. The first is that plants of "*erubescens*" grown

* Gard. Chron., Ser. 3, xcix, 282 (1936).
† STAPF in Bot. Mag., sub t. 9330 (1933).

in very poor soil in the Rock Garden at Kew were practically as vigorous and flowered as freely as plants grown in rich soil. Secondly, plants of *C. Zawadskii* grown in good soil retained all the characteristic features of the species, and though stronger and more floriferous than wild specimens, did not approach "*erubescens*" in size and luxuriance. There seems no doubt that the garden "*erubescens*" is related to *C. Zawadskii*, and especially to its variety *sibiricum*, in some way, but it differs so greatly that for practical purposes it would be better treated as a distinct species. It has every appearance of being a plant of garden origin; it might conceivably have arisen in a garden as a mutant from *C. Zawadskii* var. *sibiricum*, or it may be a hybrid with that variety as one of its parents. It cannot, however, be classed with the ordinary cultivated "Japanese" or "Chinese" Chrysanthemums, for it differs from them in several particulars, notably in the leaves and in its sweet-scented flowers.

It is most undesirable that it should continue to pass under a wrong name, and since it cannot be referred to any known species nor placed with the ordinary garden Chrysanthemums, it seems advisable to treat it as a distinct species and to rename it. The name *C. rubellum* is therefore proposed for it, and a description of the plant follows.

Chrysanthemum rubellum Sealy.*—A perennial *herb*, 80–90 cm. high. If the terminal bud of the main stem (the "crown-bud") does not abort, the main stem bears 2–4 branches towards the apex, these branches being 6–9 cm. long and unbranched, and each branch, like the main stem itself, is terminated by a single flower-head (see fig. 68). If, as so commonly happens, the growth of the "crown-bud" is arrested, with the consequent failure of the main stem to grow out and the more or less complete abortion of its terminal flower-head, then the branches arising from the lateral buds (the primary branches) grow out to about 30–36 cm. in length and branch like the main stem of a normal plant, the primary branches and each branch they bear being terminated by a single flower-head. *Stems* densely leafy with normal foliage-leaves up to the branches, then with leaves much reduced in size; stem and branches white-pubescent, densely so towards the apex, glabrescent downwards. *Normal foliage-leaves* stalked, decreasing in size towards the apex of the stem, 5·5–12 cm. long; blades 3·5–5 cm. long and about as wide, broadly triangular-ovate to ovate in outline, pinnately 5-partite with the segments coarsely toothed or lobulate (see fig. 65, *E*), the teeth or lobules subacute and mucronate, thinly leathery; upper surface bright green, pubescent towards the base on the midrib and lateral nerves, otherwise very sparsely pubescent to almost glabrous; lower surface paler and thinly white-pubescent,

* *C. rubellum* Sealy, species an hybrida nova; planta ex hortis solum cognita et *C. Zawadskii* Herbich (syn. *C. sibirico* [DC.] Forbes & Hemsley) affinis, sed habitu robustiore, caule foliis capitulis multo maioribus omnino differt. Cum *C. erubescente* Stapf confusa, sed omnibus partibus multo maioribus, caule minus ramoso, foliis magis dissectis valde recedit.—Syn. *C. erubescens* Stapf sec. Hort., Gard. Chron., Ser. 3, xcviii, 231, fig. 107 (1935); Sealy, *ibid.*, xcix, 282 (1936); Journ. Roy. Hort. Soc., London, lx, pp. 510, clxvi (1935)—*non* Stapf.

more densely so towards the base ; petioles 2–7 cm. long, white-pubescent. *Reduced leaves*, the lowest similar in form to the foliage leaves but smaller, the uppermost trifid or oblanceolate or linear-oblong and entire, the intermediates showing all stages of transition, all similar to

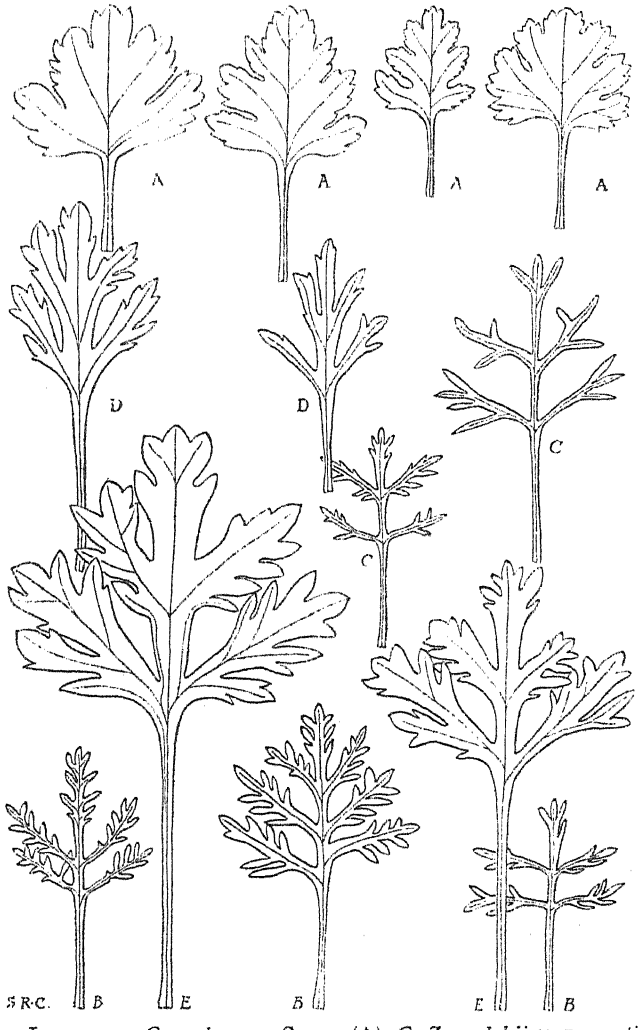


FIG 65.—LEAVES OF *C. erubescens* STAPF (A), *C. Zawadskii* VAR. *acutilobum* (B FROM GALICIA, AND C FROM SIBERIA), *C. Zawadskii* VAR *sibiricum* (D), AND *C. rubellum* (E).

All taken from near the base of the flowering stem, and all natural size.

the foliage-leaves in texture, colour and indumentum. *Involucral bracts* from narrowly lanceolate, 6·5 mm. long, 1·5 mm. wide, herbaceous, ciliate, with a rounded scarious apex (the outer), to oblong, truncate, 10 mm. long and 4 mm. wide, almost completely scarious (the inner). *Flower-heads* 5–8 cm. (mostly 6–6·5 cm.) in diameter, sweetly scented. *Ray-florets* pink ; the tube narrowly cylindrical, about 4 mm.

long; the blade oblong-elliptic, obtuse, 2–2·6 cm. long. *Disk-florets* yellowish; corolla about 5 mm. long, very narrow, slightly widened upwards, with minute erect lobes.

From *C. erubescens* Stapf, with which it was confused, *C. rubellum* differs not only in the greater size of all its parts, but also in its mode of branching (see fig. 68) and in the type of leaf, the leaves being, like those of *C. Zawadskii*, thinner in texture and more dissected than the leaves of *C. erubescens* (see fig. 65).

2. *C. Zawadskii* (syn. *C. sibiricum*) was described and figured by HERBICH in 1831,* from specimens collected on the "Pieninck" mountains ("Pieninenpass") and near the river Dunajec in Galicia (now Poland) near the frontier of Czechoslovakia, and this remains the only station for the species in Europe. It is a slender plant, 20–55 cm. high, with erect stems, which may be simple and terminated by a single flower-head or may bear 1–3 erect branches, each of which, like the stem itself, is terminated by a flower-head (see fig. 68, 1–3). The leaves are stalked, 2·5–5 cm. long, of rather thin texture, and glabrous, the blades are 1·3–3 cm. long and 1·5–4 cm. wide, pinnatipartite with dentate linear segments or bipinnatipartite (see fig. 65, *B* and *C*), and the petioles are a little shorter than the blades; in the upper part of the stem the leaves become gradually reduced in size and less dissected, and the uppermost are slightly hairy. The flower-heads are 4–5 cm. in diameter; involucral bracts 5–10 mm. long, from linear and herbaceous (the outer) to oblong, rounded at the apex, and with wide scarious margins (the inner); rays pink, 1·5–2 cm. long.

C. sibiricum was first described in 1837, as *Leucanthemum sibiricum*, by DE CANDOLLE,† who maintained the genus Leucanthemum as well as Chrysanthemum. DE CANDOLLE placed *C. Zawadskii* among the species of Chrysanthemum not satisfactorily known to him, and which he suspected would have to be referred to other genera. *L. sibiricum* was based on specimens from Siberia and on plants cultivated at Paris, and within the species DE CANDOLLE distinguished a variety "β *acutilobum*" with the segments of the leaves narrower, more acute, often dentate, and rather glabrous, as compared with typical *L. sibiricum* (see fig. 65, *C* and *D*). The genus Leucanthemum is now generally reduced to Chrysanthemum and the Siberian plant passes under the name *Chrysanthemum sibiricum*. A number of writers ‡ have treated it as synonymous with *C. Zawadskii*, but as they referred the species to other genera (Tanacetum or Leucanthemum) their work has been obscured, and *C. sibiricum* and *C. Zawadskii* have continued to be kept as distinct species. By the courtesy of the Director of the Conservatoire et Jardin Botanique, Geneva, it has been possible to examine DE CANDOLLE'S specimens, and it is found that his variety *acutilobum* is indistinguishable from *C. Zawadskii* Herbich.

* HERBICH, Add. Fl. Galic. 43, cum tab. (1831).

† DC. Prodr., vi, 46 (1837).

‡ For example, Neilreich, Aufz. Ungern & Slavon. Gefässpfl., ii, 110 (1866); Knapp, Pflanzen Galiciens, 126 (1872); Nyman, Consp. Fl. Europ., 372 (1878).



FIG. 66.—CHRYSANTHEMUM RUBELLUM IN MESSRS. REDGROVE AND PATRICK'S NURSERY.

[*To face p.* 268.

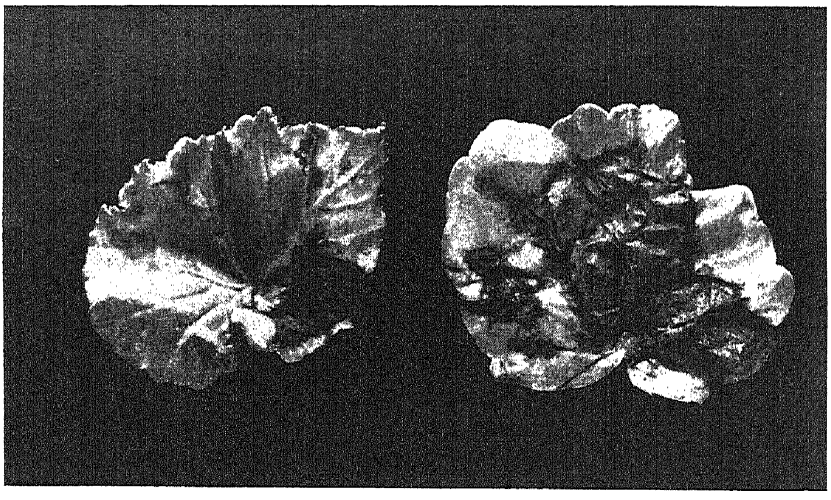


FIG. 67.—BACTERIAL DISEASE OF WINTER-FLOWERING BEGONIAS. Damaged leaves showing advance of disease along the veins.

Since the latter is the older name, *Chrysanthemum* (*Leucanthemum*) *sibiricum* var. *acutilobum* becomes a synonym of it. As stated above, the original *C. Zawadskii* was known from one station in Europe, in Galicia on the Polish-Czechoslovakian frontier. *C. sibiricum* var. *acutilobum* is found in southern Siberia, in the country from the Amur and Shilka rivers westwards to Lake Baikal and Irkutsk, and it also occurs in southern Manchuria and in Korea. In the Kew Herbarium, however, there is a single specimen, identical with the material from Galicia and S. Siberia, which was collected near Tobolsk in W. Siberia, and since this locality is about half-way between the other two areas, it serves as a connecting link between them so far as the distribution of the plant is concerned. Whether the plant occurs right across Siberia and Russia from the Amur river to Galicia, or whether we are dealing with a case of discontinuous distribution, it is not possible to say.

The question now arises, what is to be done with *C. sibiricum* proper, that is the typical *Leucanthemum sibiricum* DC. ? The specimens grouped here come from the same geographical area in eastern Asia as the var. *acutilobum*, and in addition from Japan (Hokkaido) ; the plant is also recorded from the Altai mountains, W. Mongolia, but no material from this locality has been seen. This "typical" *C. sibiricum* agrees with *C. Zawadskii* in all respects except that its leaves are rather larger and less dissected (see fig. 65, *C* and *D*), differences which are certainly not sufficient to warrant our treating *C. sibiricum* as a distinct species, especially as there are a number of specimens intermediate in leaf-characters between it and *C. Zawadskii*. *C. sibiricum* has therefore to be reduced to *C. Zawadskii*, but in view of the differences in the leaves it may be convenient to give it a distinctive name and refer to it as *C. Zawadskii* var. *sibiricum*,* the original *C. Zawadskii* of HERBICH and the *L. sibiricum* var. *acutilobum* of DE CANDOLLE being distinguished as *C. Zawadskii* var. *acutilobum*.†

Plants of *C. Zawadskii* var. *acutilobum* from Galicia were received at Kew in 1936 from the Sofia Botanic Garden. They have grown well in the Rock Garden and last autumn a flowering stem was produced.

C. Zawadskii var. *sibiricum* was in cultivation at Kew twenty years ago, but has since been lost. Judging from the dried specimens the plants showed considerable variation in the dissection of the leaves, which were about the same size and texture as those of *C. rubellum* but much more deeply dissected.

3. *C. erubescens* Stapf.—In the article accompanying t. 9330 of the Botanical Magazine Dr. STAPF enumerated those species of Chrysanthemum that occur wild in eastern Asia, and which, in his opinion, may have been used in the evolution and development of the "Chinese

* *C. Zawadskii* Herbich var. *sibiricum* (DC.) Sealy var. nov.: syn. *C. sibiricum* (DC.) Forbes & Hemsley in Journ. Linn. Soc., London, Bot. xxiii, 438 (1888) ; *Leucanthemum sibiricum* DC., Prodr. vi, 46 (1837), excl. var. *acutilobum* DC.

† *C. Zawadskii* Herbich var. *acutilobum* (DC.) Sealy comb. nov.: syn. *C. Zawadskii* Herbich, Add. Fl. Galic. 43, c. tab. (1831) *Leucanthemum sibiricum* DC. var. *acutilobum* DC., l.c.

Chrysanthemum " of gardens.* Among the wild species was *C. erubescens*, a new species based on the following synonyms :

Pyrethrum sinense var. *sinense* Maxim. in Bull. Acad. Sc. Pétersb., xvii, 425, et Mél. Biol., viii, 517 (1872).
C. morifolium var. *gracile* Hemsl. in Gard. Chron., Ser. 3, vi, 586, 652 (1889).
C. indicum var. *leucanthum* Nakai in Bot. Mag. Tokyo, xlii, 459 (1928).

It is a small plant, 20–40 (rarely –50) cm. high, with slender branched stems, the primary branches usually branched again, and all the branches, like the main stem, terminated by a single flower-head (fig. 67, 6). The leaves are small, mostly 3–5 cm. long ; the blades 1·5–3 cm. long, 1·5–3 cm. wide, broadly ovate to reniform, 5–7-lobed with the lobes toothed (see fig. 65, *A*), somewhat succulent, sparingly hairy to almost glabrous on the lower surface ; petioles 1·5–3 cm. long. The flower-heads are 2–3 cm. in diameter, with the involucral bracts 5–7 mm. long, from linear and herbaceous (the outer) to broadly elliptic and almost entirely scarious (the inner) ; rays pink, 9–13 mm. long. It is a native of N. China, where it is apparently common in Chihli, and extends westwards and south-westwards into Shansi, S. Mongolia, Kansu (?) and Szechwan ; it has also been collected north-east of Chihli in S. Manchuria (Possiet Bay).

C. erubescens is allied to *C. Zawadskii*, but differs in the following particulars :

(1) *C. erubescens* is more branched and of a looser habit than *C. Zawadskii*. In the former the stem bears numerous spreading branches which are themselves branched, and these secondary branches, like the primary branches and the main stem itself, are all terminated by a single flower-head (fig. 68, 6). In *C. Zawadskii*, on the other hand, the erect stem is often unbranched and bears only one terminal flower, or the stem may bear 1–3 branches (rarely as many as 7 branches in wild specimens ; a cultivated specimen from J. GAY'S herbarium, however, has 20 branches, see fig. 68, 4) which are sub-erect and *not branched again*,† each bearing a single terminal flower-head (see fig. 68, 1–3). The result is that *C. Zawadskii* has a much more strict habit than *C. erubescens*.

(2) The leaves of *C. erubescens* are thicker and very much less dissected, being only lobed with the lobes toothed (fig. 65, *A*), whereas in *C. Zawadskii* the leaves are pinnately 5-partite and the narrow segments are lobed or coarsely toothed (fig. 65, *B*, *C* and *D*).

* Now regarded as " an aggregation of forms, accrued as the result of skilful selection from and interbreeding of several [wild] species carried on in Chinese and Japanese gardens through many hundred years " (STAPF, *l.c.*), and not as the cultivated representatives of any *one* wild species.

† The only exceptions are : a specimen of *C. Zawadskii* var. *acutilobum* from Galicia (*W. Wagner* ex Herb. Churchill), where one of the primary branches on a strong plant bears a second flower, and a cultivated specimen of *C. Zawadskii* var. *sibiricum*, which also has a branch bearing a small second flower.

(3) Connected no doubt with the more branched habit, the flower-heads in *C. erubescens* are much smaller than those of *C. Zawadskii*,

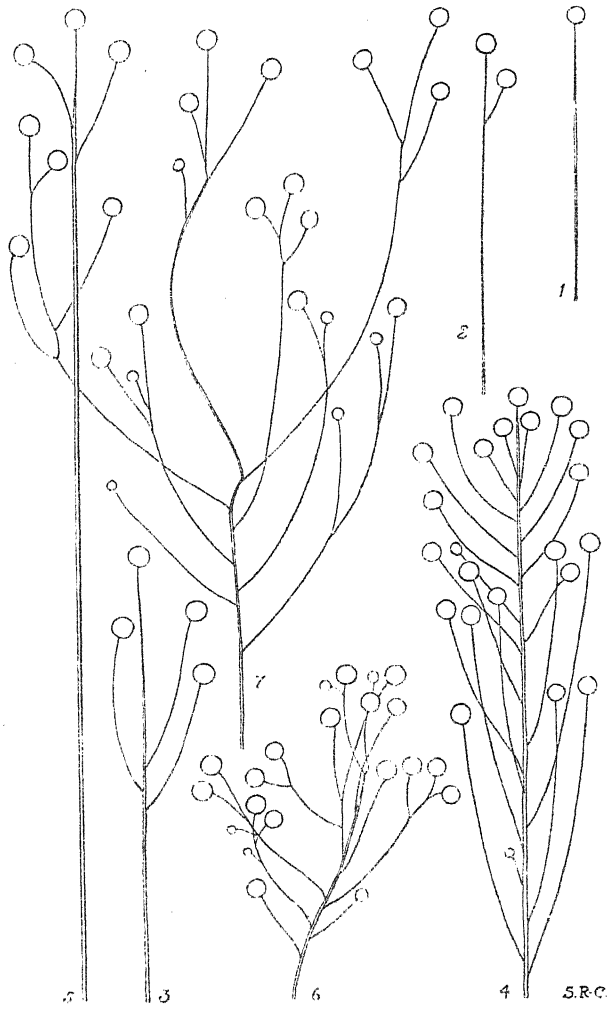


FIG. 68.—DIAGRAMMATIC REPRESENTATIONS OF PLANTS OF *C. Zawadskii* (1–3 WILD SPECIMENS, 4 CULTIVATED SPECIMEN), *C. rubellum* (5), AND *C. erubescens* (6 FIELD SPECIMEN FROM CHINA, 7 CULTIVATED SPECIMEN OF LADY LOCH'S JAPANESE PLANT), TO SHOW THE MODE OF BRANCHING.

The figures, apart from the circles which represent flower-heads, are all drawn strictly to scale and are one-fifth natural size.

being only 2–3 cm. in diameter, whereas those of *C. Zawadskii* are 3·5–5 cm. in diameter.

The sum total of these differences is such that *C. erubescens* has a very different appearance from *C. Zawadskii*, and must be treated as a distinct species. It may be noted that Dr. STAPF did not include *C. Zawadskii* among the species of Chrysanthemum which he thought

might have been used in the production of the garden Chrysanthemums, although he included *C. erubescens*. This seems quite reasonable, for some of the small-leaved garden Chrysanthemums have leaves very reminiscent of those of *C. erubescens*, whereas, apart from *C. rubellum*, none of the cultivated plants show the *Zawadskii* type of leaf.

Of the material in the Kew Herbarium, all but a few specimens are referable to either *C. erubescens* or *C. Zawadskii*. The exceptions fall into two groups, of which the first consists of three specimens collected in widely separated localities, which appear to combine characters of the two species. It is not possible to draw any conclusions from this scanty material at present, and one cannot do more than point out that the specimens are allied to the two species under discussion. The second group consists of a number of specimens from Korea which seem to represent a plexus of closely related forms, some typical *C. Zawadskii* and the rest combining the characters of that species and *C. erubescens*. It is quite possible that this plexus is the result of the two species having come into contact in this area and hybridization having taken place, and until further information comes to hand this seems to be the most reasonable explanation for the existence of the intermediate specimens, though it must be pointed out that so far typical *C. erubescens* has not been recorded from Korea.

The first of the anomalous specimens referred to above is one collected in Kansu by PRZEWALSKI (2/vii/1880), which agrees with typical *C. erubescens* in the leaves and in the size of the flower-heads, but differs in the stem being unbranched or having only one branch as in *C. Zawadskii*. The specimen was named *C. erubescens* by STAPF himself, and is probably better placed with that species than anywhere else.

Very similar to this PRZEWALSKI specimen is one collected by G. RADDE in the Bureja Mts. (near the Amur river, N. Manchuria) in 1857. In this the stem is unbranched and bears a single terminal flower-head (of which only the involucral bracts remain), and in these points the plant resembles *C. Zawadskii*. The leaves, however, are much more like those of *C. erubescens*, and the plant might be better associated with that species than with *C. Zawadskii*.*

Another specimen that combines the leaves of *C. erubescens* with a stem like that of *C. Zawadskii* is one collected at " Hsiaohu, Tian Shan, The Pamirs," by Mrs. E. C. TIECHMAN, but in this case the

* This Radde specimen may be *C. sibiricum* var. *latilobum* (Maxim.) Komarov in Acta Horti Petrop., xxv, 642, 648 (1907). The variety was first described as *Leucanthemum sibiricum* var. *latilobum* by MAXIMOWICZ (Primit. Fl. Amur., 156: 1859) from a specimen collected in the Bureja Mts., and was distinguished from the rest of *Leucanthemum sibiricum* DC. by its leaves being lobed, with the lobes coarsely toothed. RADDE'S specimen comes from the type-locality and agrees with MAXIMOWICZ'S diagnosis, but although the specimen is very probably the var. *latilobum*, it is not possible to decide whether the variety should be referred to *C. Zawadskii* or whether it is synonymous with *C. erubescens*, without seeing better material. It may be mentioned, however, that specimens determined as *C. sibiricum* var. *latilobum* by CHANG, which were kindly sent to us by Sir WILLIAM WRIGHT SMITH from the Edinburgh Herbarium, are undoubtedly referable to *C. erubescens*.

flowers are much larger than those of typical *C. erubescens* and agree in size with those of *C. Zawadskii*.

The specimens from Korea, collected by F. WATTERS, R. G. MILLS (No. 200), and E. H. WILSON (Nos. 9079, 9293, 9347 and 10684), seem to represent all stages between typical *C. erubescens*, which so far has not been recorded from Korea, and *C. Zawadskii*, which is known from this area, var. *sibiricum* being represented by Wilson 9025 and var. *acutilobum* by Wilson 9291 and 10730. Thus Wilson 9079 has the leaves and branching exactly as in typical *C. erubescens*, from which it differs only in having larger flowers; Wilson 10684 has the branching of *C. erubescens* combined with leaves which, so far as one can tell from the scanty remains, are like those of *C. Zawadskii* var. *sibiricum*; and the remaining sheets appear to combine leaves of *C. erubescens* with the branching and flowers of *C. Zawadskii*. Taken as a whole, the Korean material leads to the conclusion already stated.

Typical *C. erubescens* from China is not, so far as we know, in cultivation in this country, but there is a Japanese plant, introduced by Lady LOCH from seed which she collected near Miyanoshita in October 1928, which seems to be a form of *C. erubescens*. The latter has not been recorded from Japan hitherto, but Lady LOCH's plant, though differing from typical *C. erubescens* in having rather more deeply lobed leaves and in the apex of the rays being toothed instead of entire, matches *C. erubescens* so well in all other respects that I think it should be referred to that species. The Japanese plant certainly does not belong to *C. Zawadskii*, and differs from it in the branching, leaves and size of flower-head just as does *C. erubescens*.

Lady LOCH informs us that in its native habitat, high up on the mountains, the Japanese plant grows recumbent on the stones, and a plant which Lady LOCH sent to Kew and which was allowed to grow naturally (that is, it was not pinched or disbudded or trained in any way) produced a flowering stem that was, at anthesis, recumbent and leafless for 25 cm., and then slender, ascending, and leafy in the terminal portion, which was 35 cm. long. From the recumbent lower part of the stem seven branches were produced; these primary branches were 23–40 cm. long, and, like the terminal portion of the stem, were ascending, leafy, and branched, the secondary branches, primary branches and the main stem itself all being terminated by a single flower-head (fig. 68, 7). The flower-heads were 3 cm. across, the rays were white when they first opened and became flushed with pink on the back as they grew older.

This Chrysanthemum is quite different from the *C. Zawadskii* and *C. rubellum* grown at Kew, and it is also distinct from any other species of Chrysanthemum that we have in cultivation. Lady LOCH writes that plants can be grown from cuttings in exactly the same way as the ordinary Japanese Chrysanthemums, and that they can be trained to any shape and flower profusely.

UNUSUAL VEGETABLES.

By ANDRÉ L. SIMON.

[Read April 12, 1938; Mr. E. A. BUNYARD, F.L.S., in the Chair.]

CATS and dogs, horses and asses, and all animals depending upon us for their daily food, are perfectly satisfied with the same fare day after day. So we think. They do not complain, but it may well be that they would ask for more variety could they but speak or write to The Times. Wild animals, that is the denizens of forests and open spaces dubbed by us wild because they are free, show much more imagination than do many highly civilized men and women in the choice of their food. In the matter of meat, it is true, we must be content with the limited choice which the butcher has to offer: chiefly beef, lamb and pork, veal and mutton are all we can reasonably expect. There is, of course, a far greater variety of fish, but there is a still greater variety of vegetables for us to grow if we live in the country, or to buy in the shops of large cities, in both cases, if we are blessed with a little gastronomic imagination.

The three greatest all-the-year-round favourites among vegetables are the potato, various members of the cabbage tribe and the onion. Carrots come in only a short head behind; then turnips, parsnips and leeks. All these are admirable vegetables, and so are the fine-weather favourites—peas and beans, spinach and salads. There are a great many other vegetables grown easily in England and consumed to a large extent, although not so universally. Such are artichokes, asparagus, beetroot, celery, cucumber, mushrooms, radishes, rhubarb and tomatos. It is a goodly number, I admit, and we are better off than our domestic pets, but we could be a great deal better off still did we but stoop and look for a number of other vegetables ready to grow at our bidding that are pleasant of flavour as well as most wholesome.

There are many vegetables which are unusual in England, and must remain so. Climatic conditions, the altitude or the nature of the soil which they require are not available, and I do not propose to deal with them. The only unusual vegetables which I intend bringing to your notice are those, mostly very ordinary ones, which do or can grow in England but are difficult or even impossible for the public to buy in greengrocers' shops. Unusual vegetables which are difficult to buy are cultivated vegetables, mostly inexpensive ones, which are not generally known or else are insufficiently appreciated, as a rule simply because they are not cooked as they should be. Unusual vegetables which it is impossible to find in greengrocers' shops are wild vegetables which grow in fields, along hedges or by the sea for all to pick as they please, free of charge.

Let us take the unusual cultivated vegetables first. They may be divided into three groups, according to whether we eat their roots, shoots or fruit. The vegetables of which we eat the roots are "in season" during the winter and early spring; those which give us their tender shoots, stems or leaves are spring and summer vegetables; those which give us their fruit or seeds to eat are summer and autumn vegetables.

I. Roots.

Two of the easiest vegetables to grow, which should be much more usual than they are, are Salsify and its poor relation Scorzonera. Salsify (*Tragopogon*) is finer, white instead of black, of better flavour and more tender than Scorzonera, which can only boast that it is bigger and cheaper. Salsify is sown in the spring and ready to pull from October to February or March, that is to say, at a time when fresh vegetables are scarce or expensive. It is commonly known as the oyster plant, but I cannot say that I have ever discovered the least resemblance between the flavour and consistency of the oyster and the flavour and consistency of Salsify. I am inclined to think that the name may be due to the fact that Salsify have beards—they are called in Italian *Barba di becco*—and oysters also have beards of sorts. There are many ways of preparing Salsify for the table, most of them falling into two groups: boiling water first and a sauce; or else boiling water first and out of it into boiling fat. Salsify is not peeled, but scraped, and when scraped it is as well to drop it into cold water and lemon or vinegar so that it may remain white. Then it is boiled in plain unsalted water, with a little vinegar in it, until tender, and it can be served cut up in small lengths with any number of sauces, but white sauces are best.

Here is a good way to serve Salsify. Boil Salsify, cut them up, put them in scallop shells with a white sauce over them, a liberal dusting of grated cheese and bread-crumbs, a pat of butter or two on top of the cheese and brown under the grill or in the oven; it makes an excellent dish. Another way with Salsify, which is very popular in France, is to boil them, cut them up in 3-inch lengths, dip them in batter and fry them in boiling fat. Yet another way, and one which will appeal to the cookless and lazy ones, because there is no need to scrape the Salsify, is to wash and boil them and then mash them into a purée through a fine sieve, finishing with butter and cream, in the same manner as a Purée de Pommes. It is truly excellent; try it with boiled mutton.

Scolymus hispanicus, or Golden Thistle, is as yet very little known, but it fully deserves to be better known. It is to Salsify what Salsify is to Scorzonera, a more highly bred vegetable than either; similar in shape and habits, but not in flavour. It has a more pronounced flavour, a very pleasant one, one that is not unlike that of the Artichoke bottoms, and at a time of the year when Globe Artichokes are

an expensive and imported luxury. The Golden Thistle is grown and cooked in the same manner as Salsify.

The Japanese Artichoke (*Stachys tuberifera*) is not an Artichoke at all; it has no heart and no choke. It is very popular in France, where it is known as *Crosnes du Japon*, and it grows well in England, where it is very little known. It is a small twist of a root, and there is every reason to believe that it is unpopular with cooks on account of the waste of time inevitable if you attempt to scrape the roots. But there is no need to waste any time scraping the roots; all that is necessary is to plunge the lot in hot water, leaving them a minute or two at most, and then rubbing them in a rough dry cloth with some rock salt. Most of their tender little skins will come off and those which do not come off will not give trouble; on the contrary, they will add to the flavour of the Stachys, whether you toss them in butter or mash them into a purée. Their flavour is certainly somewhat similar to that of the Globe Artichoke, and one good point in favour of the Japanese Artichokes is that they are cooked in a very few minutes; under ten minutes in boiling water, or twelve minutes in water just off the boil, is quite enough. A peculiarity of this little root is its power of resistance to frost. It may be left in the ground during the winter and lifted just when and as required, however cold the weather may be; when stored, it soon gets dry and shrivelled, so that it is better to leave it in the ground where it will remain firm and fresh all through the winter months.

Rampion (*Campanula Rapunculus*) is another winter root of culinary merit, its root being larger than that of the Salsify, but similar in shape, whilst its foliage is much more luxuriant. It was once a favourite in England, but has now fallen into almost complete oblivion. In France, where it is known as *Raiponce*, it is grown extensively by farmers, the roots being bought by the nearest town's greengrocers, whilst the leaves are excellent forage for cattle.

Celeriac (*Apium graveolens rapaceum*, meaning celery-turnip, which is its French name, *Céleri-rave* or *Céleri-navet*) is, according to my friend Mr. BUNYARD, a celery which has concentrated its attention in making a root instead of, as usual, thickening its leaf stalks! It is an unusual vegetable in England, and yet a celery capable of concentrating its attention surely deserves our attention. It is easy to grow and equally easy to store; it will keep firm and in perfect condition for many weeks during the winter, an excellent stand-by for *hors-d'œuvre* or soup, as a vegetable with the meat course or as a course by itself. Both in France and in Germany, Celeriac is mostly eaten as a *hors-d'œuvre*. It is cut in quarters, boiled in plain unsalted water until tender, and served, when cold, with oil, vinegar, pepper and salt and chopped herbs. It is also very good in purée mashed; also stewed and served with any number of rich sauces, none better, probably, than a sauce Mornay (Cheese).

Bulbous or Tuberous Chervil (*Chaerophyllum bulbosum*) is a biennial vegetable quite distinct from the garden chervil or curly

chervil (*Anthriscus Cerefolium*), a hardy annual. It is cultivated for its root which, in shape and size, is somewhat like 'Early Horn' carrot. They are usually boiled and can be served with the meat course, but they are better as a course by themselves, being rather sweet and floury and their flavour quite distinctive, even somewhat pungent. Bulbous Chervil does not like frost and must be given a sheltered corner in the garden; even then, it is doubtful whether it would repay growing in England except in the South and West. The old English cookery books dismiss it as being poisonous, but I am inclined to think that it is a case of sour grapes, a case of a disgruntled gardener taking the fair name of Bulbous Chervil away because he could not grow it. Bulbous Chervil mashed to a purée, known in culinary French by the name of *Purée Chevreuse* is very good; and so are *Beignets de Cerfeuil* or Chervil fritters.

Kohlrabi (*Brassica oleracea caulorapa*) is a most unusual cabbage with a root like a turnip and half of it out of the ground, stem-like. It is best when small for gourmets, when first of all it is boiled in salted water, then drained, cut in quarters when cold, and dressed with oil and vinegar. It is very popular as a salad in Germany. If allowed to grow, it becomes as large as Swedes or Rutabagas, and it is still quite good then mashed in a purée. On the Continent it is chiefly used when fully grown as winter food for cattle.

II. Shoots.

Asparagus is undoubtedly the best of all the vegetable shoots we have in England, and there is nothing disparaging to Asparagus in bringing to your notice shoots of two other plants which grow most easily in this country, although they are never served in any hotel or restaurant, excellent as they both are. They are Hop-Shoots and Pokeweed.

Hop (*Humulus Lupulus*) is not grown for the kitchen, but for beer, as we all know, but in the spring, when tender and eager little shoots start from the crown underground, in the hope to reach the top of the pole six months later, all are not allowed to enter the race. The farmer chooses the two strongest-looking ones and cuts off the others. In Germany, in Belgium and in Northern France, where there are extensive hop-fields, the prunings or hop-shoots are sold in bundles as *jets de houblon* and cooked in the same way as Asparagus. In England, some people in Kent eat them in the same way; others just throw them away.

Pokeweed (*Phytolacca edulis*) is a very different proposition, and I am particularly keen about it, having reintroduced it as a vegetable into England, where it has never ceased to be grown as an ornamental plant. I grow it and I enjoy it in May. I am proud to see that it is now included in Bunyard's Catalogue, Vegetables for Epicures.

Pak is American Indian for blood; Pocan or Pakon is a plant

that yields a red or orange dye; hence Poke, Pokeberry and Pokeweed.

Pokeweed is a native of North America, one of the first to be introduced into Europe in the sixteenth century. It is to be found in waste places, woods and thickets, usually in moist soil, but also in stony fields, from Maine to Ontario, Minnesota, Arkansas, Florida, Mexico and Bermuda. It is described by HOMERE D. HOUSE, in Wild Flowers (Macmillan, 1934), as "a tall, strong smelling, succulent and glabrous plant with an erect herbaceous stem, 3 to 10 feet tall, from a large perennial, poisonous root."

To botanists Poke is known as *Phytolacca americana*; to American farmers as a troublesome weed; to coloured people in the Southern States as a delicious and most wholesome vegetable, and the cheapest there is, since you cannot buy it in shops. It grows wild in such plenty that it is never difficult to get; but only in the early spring, that is, before it gets coarse and uneatable.

The poisonous root of Phytolacca has long been used by herbalists to prepare a powder that is supposed to be excellent for slimming, but the greatest measure of popularity that Poke enjoyed on both sides of the Atlantic was due to its purple berries, each one-fourth to three-eighths of an inch in diameter and full of crimson juice.

French pastry-cooks of the seventeenth and eighteenth centuries used, almost exclusively, Pokeberries to colour all sorts of sugary confectionery, *dragées* and *pralines*, whilst Pokeberries were used in Portugal to add colour to the wines of the country, until an order was issued by the King of Portugal "that all stems be cut off before the flowering time, as it has been found that the red juice of the Pokeberries debases the flavour of wine" (CHARLES BRYANT, Flora Diaetetica, London, 1783).

As late as 1876, Madame HENRIETTA DAVIDIS, in her Jardin Potager and Fleuriste, gives directions how to prepare a "jus" from Pokeberries, for colouring sauces, jellies and milk sweets, although long before that date the Pokeweed scarlet vegetable dye had been replaced by the Cochineal, a flavourless dye extracted from a small insect of the Coccid family, originally imported into Spain from Mexico and Peru.

Pokeberry still supplies "rouge" for pale-cheeked Virginian and Maryland maidens who cannot afford to buy rarer cosmetics, but my own interest in Pokeweed is not with the slimming properties of its root nor with the red dye of its berries. It is with the shoots of the plant when young, the tender stems and leaves, excellent as a vegetable whether served hot with cream, like Spinach *en branches*, or cold with oil and vinegar, like green Asparagus.

In PALLIEUX ET DU BOIS Le Potager d'un Curieux (Librairie de la Maison Rustique, Paris, 1885, p. 228) there is a reference to the Revue Horticole of 1847 (vol. ix, p. 218) mentioning that *Phytolacca decandra* was at the time much esteemed in the United States and that most Paris restaurants listed it on their bills of fare from January

to March. In the Flore des Antilles DESCOURTILZ refers to Pokeweed as a common food of the people, and WILLIAM DARLINGTON speaks of it, in 1847 (Agr. Bot. Philadelphia), as being a good substitute for Asparagus.

As a matter of fact, the white-pinkish stems have a distinct Asparagus flavour, whilst the green leaves which sprout from the stem taste more like somewhat sharp yet not acid Spinach. The combination of both flavours is a little puzzling, but to my taste quite attractive, and I wondered why Pokeweed had ceased to be on restaurants' bills of fare in New York, London or Paris. In fact, the very name of it seemed to have been completely forgotten, and I never heard it mentioned until I had the good fortune to meet Dr. MARGARET B. WILSON in Washington, and she told me about Pokeweed. With that thoroughness for which she is so justly famed among men and women of taste and science, she found in the stems and leaves of Pokeweed, when lightly boiled, an acid which might very well be called poisonous, so active was its action upon the bowels. But when Poke is boiled in two waters, and the water well drained away, there is no irritation nor any ill effects to be feared, just a slightly laxative action which is most beneficial, and the flavour is by no means destroyed.

Another member of the Pokeweed family, *Phytolacca acinosa* or *P. esculenta*, is the Yama Gobo of the Japanese. There are records of some being grown in France in 1851, and in Glasgow in 1836. Dried Gobo, in diagonally cut slices, is sold by Japanese grocers in New York, but Dr. MARGARET B. WILSON, who has cooked and tried it, did not find its flavour distinctive.

III. STEMS AND RIBS.

Cardoon (*Cynara Cardunculus*) is a hardy cousin of the Globe Artichoke, one that is far more leafy. Its leaves are its chief beauty; they are large and silvery; they are also noted in gastronomy, their midribs providing a celery-like vegetable from October to December, at a time when there are not so many vegetables available as during the summer months. Cardoons are cooked in the same many ways as Celery branches.

Chard Beet or Seakale Beet (*Beta vulgaris*), known in France as *Poirée* or *Bette*, is a hardy and extremely useful vegetable, extensively cultivated in France and very little known in England. In summer the green part of the leaves may be used in the same way as Spinach, or mixed with Sorrel, being free from acidity and toning down the oxalic acid of Sorrel; but this vegetable is chiefly grown for its chards, that is, its broad, white, tender midribs which are a useful addition to the choice of vegetables in the autumn. These chards or ribs are boiled in salted water and either dressed with a white sauce or any other sauce, or else allowed to get quite cold, cut up in small pieces, dressed with oil and vinegar and served as a salad.

Fennel (*Foeniculum dulce*), the Italian *Finocchio* and French *Fenouil de Florence*, requires a little coaxing to grow in England. It must be protected from frost and freely watered during the summer. In the autumn it is earthed like Celery, and the base of its leaves, or stem, which grows to the size of a woman's fist, is excellent when bleached and firm, whether eaten uncooked or braised, just like Celery. It has a nutty taste with a faint aniseed flavour, quite distinct from that of any other vegetable. Fennel has been served at some of the Wine and Food Society's Dinners and it has been greatly liked on each occasion.

Chinese Cabbage (Pe-Tsai) grows very well in England, far as it is from its native China, providing it is given plenty of water in dry summers. It is an unusual cabbage : it has neither head nor heart, but swollen leaf stems, somewhat like Chard Beet, and they are cooked in the same way.

Japanese Welsh Onion (Nebuka) is a newcomer, a wonderfully good-tempered variety of the Welsh Onion from the Far East. It is a perennial which produces white upstanding stems, like Leeks, with tubular leaves in Onion fashion. Being perennial, one pulls off a leek or two as required, and a little earthing is all that is needed to keep the plant going. I have not grown it yet, and the information which I am passing on to you is from BUNYARD'S Catalogue, Vegetables for Epicures.

IV. LEAVES.

Orache is, I am told, an excellent form of Spinach which I confess I have not tried, but I can recommend to you from personal experience all manner of salads which are too often dismissed as mere rabbit's food, although they are very good and should be accorded a far warmer welcome than is usually theirs, more especially as they are available during the winter months, when lettuce is not in England.

Corn Salad (*Valerianella olitoria*), and in French *Mâche* or *Doucette de Paris*, would be much more popular in England than it is were it grown more freely and sold when the leaves are still quite small and tender. The only way to get Corn Salad of the right age and size seems to be to grow it oneself and to pull it oneself also. I have never seen it in a shop except too large, nor have I ever known a gardener who could bring himself to pull it before it had acquired some flat, shiny, dark green leaves, that is to say, when too old to be really good. Corn salad seed is so cheap, and Corn salad sown in heavily manured light soil, under a frame, will grow so quickly, that there is no reason why it should not be sown week after week and used when it is very young, small and tender. It is usually dressed with oil and vinegar and mixed with cooked red Beetroot and a few nutty, fresh, white sticks of Celery.

Endive (*Cichorium Endivia*) is, during the winter months, what the Lettuce is during the summer. There are a number of different

members of the Chicory family as there are of the Lettuce tribe, and all the Chicories have a family likeness of bitterness; they are bitter but fair and wholesome, like criticism can be. The two most important members of the Endive family are the Batavian Endive or Scarole and the Brussels Endive or Whitloef. The first is a curly-leaved salad which can be cooked like Lettuce, boiled and braised or stewed in stock; the second is forced and grown in the dark, being silvery white with white-yellow tips. They can be braised like Celery or baked with a covering of grated Parmesan cheese and bread-crumbs. Among other sorts of bleached winter Chicory there is the wild sort, *Cichorium Intybus*, called in French *Barbe de Capucin*, the bitterest of all, which is not cooked but served as a salad, usually with sweet red Beetroot to tone down its bitterness.

V. Fruit and Seeds.

Of all the vegetables offering us their fruit as food none is more generous and yet none is less appreciated, in England, than the Pumpkin. Under this name, which does not correspond to any botanical division, we are told by Messrs. Vilmorin Andrieux (The Vegetable Garden, 1905, p. 316) there "are grouped a certain number of varieties of *Cucurbita maxima* which are remarkable for the great size of their fruit." And they tell us that Pumpkins may often be seen at the Paris Central Market which weigh over a hundredweight each. The commonest type of Pumpkin, to be seen during the winter months at every French greengrocer's doorway, is the large yellow Pumpkin which is closely related to the Connecticut Field Pumpkin of America. Its flesh is yellow, firm and sweet, and it keeps for quite a long time; it is full of vitamins, iron and other excellent health-giving properties which cost so much in the form of pills and patent medicines, and its flavour is excellent. There is only one thing against it: the Pumpkin is too big; it takes up too much space. It is true that greengrocers' shops are no bigger in France than in England, but the demand for Pumpkin in France is so brisk that it is never long in the way. Could the public, in England, be made to realize how good and cheap Pumpkin soup and Pumpkin pie are, there is no reason why such an excellent vegetable should not grace every greengrocer's window. Pumpkin soup is made in more than one way, but in all the slice of Pumpkin is peeled, the flesh cut up in squares, which are boiled in a little water until quite soft. From that stage onwards there are different ways of proceeding; one may rub the pumpkin through a fine hair sieve and make a soup with the pulp, some good stock, a little cream and the yolks of two eggs to bind it all. Or else mix the pulp with milk and sweeten with sugar; this is sure to be very popular in the nursery, and there is no better soup for children.

Pumpkin pies and Pumpkin puddings are among the most popular pies and puddings of the Eastern States of America, and there is also

mashed Pumpkin, as a vegetable served with a meat course, prepared in the same way as mashed potatoes.

Allied to the Pumpkin are the many varieties of Gourds, Squashes and Marrows, of which far too few are generally appreciated or even grown in England. Not that Squashes and Marrows hold a very high place in the sphere of gastronomy, but they are useful vegetables, being so easy to grow and correspondingly inexpensive. On the whole, they are too watery and they are lacking in flavour, but that is where the cook's imagination comes in; there are ever so many ways to stuff Vegetable Marrows or to use them as a background for some highly seasoned and delicious sauce.

Egg-plant (*Solanum Melongena*), a native of India, cannot be grown out of doors in England successfully, but there is no reason why it should not be grown under glass far more extensively than it is at present. Egg-plants lend themselves to ever so many ways of cooking; they can be baked, boiled or broiled by themselves; they can be used as stuffing for omelettes, or stuffed themselves with all manner of fillings; they make excellent fritters but, being a fruit of the South, the best recipes are of the South, such as *Aubergines grillées à la Provençale*, which are Egg-plants cut in two, longways, soaked in olive oil and grilled; *Aubergines à l'Italienne*, which are Egg-plants cut in two, longways, and fried; their pulp is taken out and mixed with tomatos and vegetable stuffing, returned to the Egg-plant skins, sprinkled with bread-crumbs freely watered with melted butter and then browned in a quick oven; *Aubergines Andalouses*, which are Egg-plants stuffed with tomatos, pepper and chopped up ham; *Aubergines Sautées à la Niçoise*, which are Egg-plants peeled, cut in rounds, floured, cooked in oil and mixed with tomatos and peppers also cooked in oil separately with a little garlic. But you have only to turn to your cookery book for many more detailed Egg-plant recipes.

The very large Bean family is, of course, very well known, and many of its members are among the most popular of all vegetables. But there are other members of the Bean family which are still unusual and deserve fuller recognition. There is the Blue Coco Bean for instance, one of the first favourites of the Hon. Mrs. ALAN GARDNER; it is a hardy runner bean which has a very delicate and distinctive flavour; it also possesses the curious habit of shedding its purple hue in cooking when, in Mrs. ALAN GARDNER'S words, "it dons a coat of the brightest green which, as it never turns to a sickly yellow, delights the eye." Then there is the Lima Bean (*Phaseolus lunatus*), a runner bean of real gastronomic excellence. It is a native of South America, long since adopted in North America, but, so far, too shy of the English climate to have made many friends in this country. There are many different varieties of Lima Beans, runner and dwarf, large and small, and some day a hardy variety will probably become available. At present, Lima Beans can only be grown in England with any chance of success out of doors where tomatos can be ripened; they are very

susceptible to frost. They are shelled and cooked like young Broad Beans, and their flavour is more delicate than that of Broad Beans; however, as the Lima Beans are not ready until the autumn, long after the Broad Beans have ceased to be available, they do not compete.

Then there is another great family justly famed in the annals of gastronomy, the Pea family (*Pisum sativum*), the pride of English kitchen gardens. There is no other vegetable more perfectly suited to English climate and soil than the Green Pea, and the same may rightly be said of the Sweet Pea; no other land can grow Sweet Peas like England and Scotland. But there are other peas besides Green Peas and Sweet Peas. There are the Sugar Peas, excellent peas and yet quite unusual in England. They differ from all the other peas which may rightly be grouped under the heading of Shelling Peas in this, that their pods are edible; they are free from the inside thin but hard and tough parchment-like membrane which forms the lining of all Shelling Peas' pods. Hence they are called in French *Pois sans Parchemin* or *Pois Mangetout*. In Shelling Peas, the drying and consequent contraction of the pod lining, as the pod ripens, causes the pod to burst open into two equal parts. In Sugar Peas, which are destitute of lining, the pod remains soft and tightly closed even when fully ripe. In Shelling Peas one must throw away a great deal more than one can use; in Sugar Peas there is no waste. This alone should be an attraction, not merely to Aberdonians, but to all careful housewives. It is, however, the least merit of the Sugar Peas. Their greatest appeal is their excellent flavour. There are quite a number of different sorts, early and late, dwarf and climbing. They can be grown in successive sowings, and they can be enjoyed during four months of the year. They can stand a dry spell better than Shelling Peas, and they also have the advantage of being very good long before the baby peas inside have grown to any size and attracted the attention of greedy little birds. Sugar Peas are best in soups, steamed and *sautés* in butter with chopped herbs, but no sauce unless it be a little fresh cream.

Indian Corn or Maize (*Zea Mays*) is one of the most wonderful of the late summer's vegetables, that is, in all sunny lands. A native of America, it is the staff of life of African natives, and it is grown to a considerable extent in most European countries. It is uncommon in England because the English summer does not start early enough to give the Sweet Corn a chance to reach a full degree of maturity before the autumn frosts. I have never dared to grow it, greatly as I have enjoyed Sweet Corn in South Africa, but I quote again the Hon. Mrs. ALAN GARDNER as my authority that a strain has now been discovered that will ripen in our short English summer, and no one need hesitate to venture on growing it. If Sweet Corn can be grown in England to any large extent, that is in sufficient large quantities to be retailed at a really popular price, it will be a great boon.

The best way to deal with Sweet Corn in the privacy of one's home is to boil the cobs for about twenty minutes and eat them mouth-

organ fashion with salt, pepper and fresh butter on them, gnawing at the corn with one's front teeth, rabbit-like. They never taste so good in any other way. However, when the evening is a party and hands must be kept off, there are many other ways of dealing with Sweet Corn. It can be made into soups and puddings, or served as a vegetable, *sauté* in butter or with cream.

Capsicum annuum, or Red Pepper, *Piment* in French, a native of South America, is an annual which is cultivated very much like the Aubergine or Egg-plant. There are sheltered gardens in the South of England where the Red Pepper grows out of doors but, as a rule, the greenhouse is a safer place. There are quite a number of varieties of Capsicums, the commonest of all being the Long Red Spanish Pepper; the longest, the Long Black Mexican Pepper; the palest, the Long Yellow Pepper; the most colourful, the Cardinal Pepper; and the hottest, the Long Cayenne Pepper. This list does not exhaust the variety of Long Peppers, and there are quite a number of others, round, pear-shaped, squash-shaped and many other shapes, some hot and some sweet. They are all uncommon in England and likely to remain so, as the art of cooking Peppers has never been mastered, except by Spanish cooks.

The Okra or Gombo (*Hibiscus esculentus*) is a native of South America grown extensively in the Southern States of North America and in the Near East. It has been served at one of the dinners of the Wine and Food Society, and had a polite but not enthusiastic reception. It can be grown in England like Egg-plant, and its longish green seed-pods are used in the making of soups or sauces. It is one of those uncommon vegetables likely to remain uncommon in England.

Wild Vegetables.

And now let us briefly survey the commonest of all vegetables, common weeds, which are uncommon in the kitchen because they are not sufficiently appreciated or because they are not within our grasp. They are cheaper than any of the cultivated vegetables since, as a rule, you cannot even buy them because there are not enough people who know and care for them to make it worth anybody's while to pick them and send them to shops to be sold. There is evidently nothing new in our disregard of the free supply of green saladings and wholesome vegetables in fields and hedges, since Sir Thomas Moore wrote nearly 400 years ago: "Many a poor knave's pottage would be improved if he were skilled in the properties of the Burdock and Purple Orchis, Lady's Smock, Brooklime and Old Man's Pepper. The roots of wild Succory and Water Arrowhead might agreeably change his Lenten diet and Glasswort afford him a pickle for his mouthful of salt meat. Then there are Cresses and Wood Sorrel to his breakfast and Salep for his hot evening mess."

Mrs. M. Grieve, F.R.H.S., than whom no greater enthusiast ever lived to sing the praises of Herbs and Vegetables in the Wild, gives



FIG. 69.—BACTERIAL DISEASE OF WINTER-FLOWERING BEGONIAS.
Showing diseased leaves.



FIG. 70.—BACTERIAL DISEASE OF WINTER-FLOWERING BEGONIAS.
Showing diseased petioles and stems.

[*To face p.* 285.

the following list of Salad plants which can be gathered wild in England:

"Bladder Campion—Bittercress—Bracken—Brooklime—Burdock—Chicory—Dandelion—Yellow Dock—Fennel—Houseleek—Lamb's Lettuce—Lovage—Marigold—Pepperwort—Primrose—Samphire—Scarlet Pimpernel—Scurvy-grass—Sneezewort—Stinging Nettle—Sweet Cicely—Wintercress—Winter Purslane—Wood Sorrel—Yellow Goatsbeard."

I am ashamed to say that, out of this long list, I have only tried two weeds which flourish but too well in my garden—Stinging Nettles and Dandelions—the first cooked like Spinach, and the other in a salad, like Corn Salad.

A BACTERIAL DISEASE OF BEGONIA.

By W. J. Dowson, M.A., D.Sc., W. C. Moore, M.A., and L. Ogilvie, M.A., M.Sc.

In August 1937 a hybrid winter-flowering Begonia plant (var. 'Emita'), affected by a bacterial disease, was received at the Plant Pathological Laboratory, Harpenden, from a private garden in Herts, and about the same time similarly affected plants were seen among a large collection of winter-flowering Begonias in Somerset. Somewhat later in the year the disease was observed at two other localities in Somerset and Oxon, and from inquiries made it became apparent that this trouble has been familiar for some years to propagators of winter-flowering Begonias up and down the country. It was not until 1935, however, that the true nature of the disease was realized. In October of that year affected specimens, grown in a private garden near Leicester, were sent to the Royal Botanic Gardens, Kew, and Miss E. M. Wakefield has informed us that these plants were infected with a bacterial disease closely resembling the one now to be described. What is evidently the same disease has also caused much concern on the Continent during the past ten years, and it therefore seems desirable to draw the attention of growers and of plant pathologists to its true nature and to the serious losses that may be expected if steps are not taken to prevent its further spread.

The first symptoms appear as minute, glassy spots on the undersides of the leaves, especially near the margins, and in lines running parallel to the main veins. They are easily overlooked and can be seen best when the leaves are held up to the light. As the spots increase in size they become clearly visible as water-soaked, pale areas. Frequently two or more of them may unite, and in time the greater part or even the whole of the leaf may become attacked (figs. 67 and 69). The affected tissues are flabby at first, and later they turn brown and die; meanwhile the larger and smaller veins become deep brown or black (fig. 67). The attack on the foliage is often followed by the development of more or less extensive brown, dark brown or black, rotted areas on the leaf stalks and stems (fig. 70). Not infrequently the stems break off at these places and the plants topple over. Sometimes, particularly in varieties with small circular leaves such as 'Optima' and 'J. Mensing,' the stems may be attacked first, and in such instances the first sign of the disease is usually a leaden colour in the foliage, followed by general wilting of the plant. Moderately affected plants are much weakened by reason of the progressive loss of leaves, while badly attacked plants generally die.

If the stem of an affected plant, or the main vein of an affected leaf be cut across, a yellow, sticky slime soon oozes out, or may easily be

pressed out of the tissues. This slime consists almost exclusively of bacteria, and these are the cause of the disease. The bacteria are at first restricted mainly to the water-conducting tissues, and the disease is primarily vascular, with resulting leaf wilt, vein blackening and stem rot.

The origin of the disease is unknown. Over forty years ago a bacterial disease of *Begonia Rex* and *B. ricinifolia*, attributed to *Bacillus caulivorus*, was reported in France (6) and a similar disease of 'Gloire de Lorraine' plants was noted in Denmark in 1906 (7). No details were given, however, and it is only recently that reliable information about the disease forming the subject of this article has become available. It was found affecting 'Gloire de Lorraine' plants in a few gardens in Denmark in 1927 and 1928 (1), and in 1933 BUCHWALD (2) briefly described its occurrence there in the variety 'Optima.' He observed that a yellow, motile bacterium, which he named *Bacterium Begoniae* Buchw. (but without describing it), was invariably present in the affected tissues, and he assumed that this organism was the cause of the disease, though he did not prove it by inoculation experiments. Two years later, however, the necessary proof was provided by WIERINGA (8), who studied the disease in Holland, where it appears to have been known since 1929. WIERINGA also found a yellow bacterium in the affected tissues, but he regarded it as non-motile and therefore presumably different from the Danish organism. He named it *Phytomonas flava Begoniae* and by inoculating it into healthy Begonia plants he succeeded in reproducing the disease artificially. More recently the disease has been reported from several localities in Germany (3, 5, 9, 10). Most of the writers have emphasized the serious nature of the disease and the heavy losses that may be sustained from it.

Both the large- and the small-flowered forms of the winter-flowering *B. socotrana* hybrids may be attacked, especially the former, but varieties differ markedly in their relative susceptibility. 'Clibran's Pink,' 'Altrincham Pink' and 'Optima' are perhaps the most susceptible, but 'Baardse's Wonder,' 'Mrs. Baardse,' 'Baardse's Favourite,' 'Dazzler,' 'Emita,' 'J. Mensing' and 'Orange Sun' may also be severely affected. On the other hand, 'Ege's Favourite,' 'Exquisite,' 'Pink Perfection,' 'Fascination,' 'Star' and 'Flambeau' appear to be much more resistant. The disease has not been observed on 'Gloire de Lorraine,' or on summer-bedding varieties of the semperflorens type in this country, but has occasionally been reported on the first named in Europe and observed on *B. tuberosa* in Portugal. The disease is rarely seen in the cutting beds, and is most prevalent during the summer months, when the plants are subjected to high temperatures to promote rapid growth. The bacteria enter the plant through small wounds or abrasions, and perhaps also through the uninjured surfaces of the leaves.

When fragments of the diseased leaves or petioles taken from the English material were mounted in water and examined under the microscope, bacteria diffused out in large numbers, and by using sterile

water in which to macerate the tissues pure cultures of a yellow bacterium were readily secured by the usual plating method. After subculturing in broth and transferring to slopes of beef-infusion agar a suspension of the bacteria in sterile distilled water was sprayed, in October, over a number of healthy plants of the varieties 'Gloire de Lorraine,' 'Eclipse,' 'Exquisite,' 'Emita' and 'Optima.' Some of these were placed at once in the saturated atmosphere of a small glasshouse at 77° F., others were placed on the bench of another glasshouse with an average temperature of 62° F. and covered with belljars for two to ten days, and the remainder were left uncovered on the same bench. After ten days those in the warm moist glasshouse were taken out and placed beside the other plants, all of which were then uncovered. The plants had therefore been subjected to various conditions of temperature and humidity from moderately dry at 62° F. to a saturated atmosphere at 77° F. The disease appeared after ten to fourteen days as small marginal discolorations on the plants which had been under belljars or in the warm and moist greenhouse, while those left uncovered throughout showed similar symptoms after three to four weeks. The affected areas rapidly enlarged and eventually all the sprayed plants developed the disease very severely and died. Meanwhile the yellow bacterium was re-isolated from some of the plants and was used to repeat the experiment. Similar results were again obtained with the above varieties and also with 'J. Mensing' and 'Orange Sun.' Finally, the same organism was again re-isolated and was sprayed on to a third set of plants with the same ultimate result, though the disease took longer to develop. The third spraying was done in December and as the plants were then approaching their dormant period, and the temperature was appreciably lower, it is probable that they were more resistant to infection. As the organism re-isolated on both occasions was exactly similar to the bacterium present in the originally affected tissues there can be no doubt that the disease is due to this organism.

The bacteria that ooze out of the affected tissues appear either as short rods with rounded ends or as ovals. Many of them are actively motile. Stained in carbol thionin blue the rods measure 0·9–1·7 × 0·5μ and the ovals 0·9 × 0·5μ. In pure culture growing on nutrient agar or steamed potato, the individual cells, many of which are motile, appear larger and much longer, probably due to the adhering of two daughter cells to form short chains. In stained preparations a distinct constriction is visible in the middle of what appears to be an elongated cell. The congo red relief stain shows the same thing, individual cells measuring 1·7–2·0 × 0·6μ and double cells 2·6–3·5 × 0·6μ. On nutrient agar at 27° C. (80° F.) colonies appear in two to three days as minute transparent drops which on the third or fourth day assume a definite yellow colour. Well-separated colonies reach a diameter of 5 mm. in about a week and are mustard yellow, flat, shining and not quite round in outline. On dextrose agar and on sterilized potato the growth is abundant, slimy and similar in colour. The organism is

gram negative (and therefore not acid fast) and possesses one long polar flagellum which can readily be demonstrated by Morton's Light Blue staining method. Gelatine is slowly liquefied. A little acid is formed after three weeks in dextrose, sucrose, lactose, and maltose, but none is formed in glycerine, salicin or xylose. Starch is rapidly digested and hydrogen sulphide and ammonia are formed from peptone, but not indole. Nitrate is slowly reduced to nitrite, which can be detected after three weeks' growth. The methyl red test is negative as is also the Voges-Proskauer reaction.

This description differs somewhat from that of *Phytomonas flava Begoniae* Wieringa which rapidly liquefies gelatine, but does not reduce nitrate and is moreover non-motile. Both belong to the group of yellow bacteria that includes *Bacterium flavozonatum* McCull., the cause of a different leaf spot disease of Begonias in the United States (4), *Pseudomonas campestre* (Pamm.) E. F. Sm., *P. hyacinthi* (Wakk.) E. F. Sm., *P. juglandis* Pierce and many others. The English organism, however, appears to be distinct from all of these. It may be identical with the imperfectly described Danish organism, and for the present, therefore, it is proposed to call it *P. Begoniae* (Buchw.) Pape emend. Dows. It should be mentioned that in October 1937 Mrs. M. D'OLIVEIRA sent one of us (W. J. D.) a culture of a bacterium, thought to be *Bacterium flavozonatum* McCull., that had been isolated in September 1935 from leaf spots occurring on *Begonia tuberosa* at Cintra in Portugal. So far as is known only tuberous Begonias were infected and the disease was not a vascular one. This culture was compared with the English organism and with a culture of the American organism, kindly sent by Miss MCCULLOCH. It was found to be distinct from *B. flavozonatum* and to agree in every respect with the English pathogen.

No carefully planned experiments have yet been carried out in an attempt to control the disease by spraying or dusting the plants with fungicides or bactericides, but it can largely be held in check by taking suitable precautionary measures. Substantially attacked plants must be removed and burnt as soon as possible, and it is best to treat all the affected plants in the same manner, though with care it is possible to cut away the diseased parts when the attack is only a slight one. If this is done, however, the knife employed for the purpose must not be used on a healthy plant unless it is previously dipped in lysol or some other suitable disinfectant, or the bacteria will almost certainly be conveyed on the knife (to say nothing of the operator's hands) and be introduced into the healthy plant. Equally strict hygienic precautions must be observed in selecting cuttings, and these should on no account be taken from affected plants. Where possible the plants from which the cuttings are to be taken should be isolated in a disinfected greenhouse and should be touched only with disinfected hands and tools. The cuttings should be raised in sterilized soil and the pots to which they are transferred should also be disinfected. There is some evidence that infection may be carried in contaminated water supplies, where

these are drawn from tanks to which dead Begonia material may readily gain access. It is therefore preferable to water the plants with water from a mains supply. High atmospheric humidity undoubtedly favours rapid spread of the disease, and by maintaining the humidity of the glasshouse at as low a level as possible, and providing adequate ventilation, the progress of the disease can be hindered materially. Finally, every effort should be made to avoid wounding the plants when tying-up or during watering or other operations.

In view of the discovery that *P. Begoniae* causes a leaf spot of tuberous Begonias in Portugal the possibility that these varieties may become infected in this country must not be overlooked. Indeed it may be that the disease is already present on them, but to so slight an extent as to escape notice. In such an event they would, of course, serve as a source of infection for the more susceptible hybrids, especially where both kinds are raised in close proximity to one another.

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PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Amelanchier oblongifolia. A.M. April 5, 1938. From Mr. W. J. Marchant, Wimborne. This species from the U.S.A., where it occurs from Maine to S. Carolina, forms a large shrub of upright habit with oblong to obovate-oblong, finely serrate leaves turning blood-red in the autumn. In the spring the branches are covered with erect sprays of starry, creamy-white flowers.

Anemone blanda Ingramii. A.M. March 29, 1938. From Alpine Nurseries Ltd., West Moors, Dorset. A variety of *A. blanda* with large brilliant blue flowers.

Angraecum rhodostictum. A.M. April 5, 1938. This plant had been collected in Kenya by Mr. John St. Maur Ramsden, Bulstrode, Gerrard's Cross, Bucks. It bears spikes of creamy white flowers in which the column is of reddish colour, hence the specific name.

Carnation 'Eva.' A.M. April 20, 1938. A perpetual flowering variety of very vigorous growth and free flowering habit, with very stiff and good stems. Flowers 4 inches diameter, clear white, sweetly scented, centre rather full; petals slightly fringed. Exhibited by The Farnham Royal Nurseries, Slough, Bucks.

Carnation 'Marchioness of Headfort.' A.M. April 20, 1938. A free-flowering perpetual variety of good habit, with very stiff stems and a good calyx. Flowers 3¾–4 inches across, bright clear cherry-pink, margins of petals paler, centre rather full; petals slightly fringed. Exhibited by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath, Sussex.

Carnation 'Mellow Pink.' A.M. April 20, 1938. A perpetual flowering variety of robust habit and very free-flowering with a good stem and calyx. Flowers 3¾ inches across, clear shell-pink of good form and substance, centre not too full; petals slightly fringed. Also known as 'Eleanor.' Exhibited by Messrs. Allwood Bros.

Carnation 'Peter Fisher.' A.M. April 20, 1938. A perpetual flowering variety of good habit and free-flowering, with a good stem and strong calyx. Flowers 3½ inches across, light rose-pink, somewhat scented, full centred; petals deeply fringed. Exhibited by Messrs. Allwood Bros.

Cassiope rigida. A.M. March 29, 1938. From Mrs. A. N. Griffith, Paradise House, Newnham, Cambridge. A small Japanese species of neat habit with comparatively large white semi-pendulous bells. A particularly well-grown plant, which won the Alpine Garden Society's Farrer Medal for the best pan in the Amateur's section.

Clianthus puniceus. A.M. April 26, 1938. From Mr. W. J. Marchant, Wimborne. The Crimson Glory Pea was discovered in New Zealand by Sir Joseph Banks, and first flowered in this country

rather more than a century ago. In very favoured districts it flourishes outside if planted against a wall, and there produces many light crimson flowers, in pendent racemes of 5 or 6. Elsewhere it requires the shelter of the greenhouse.

Corydalis cashmeriana. **A.M.** March 29, 1938. From A. N. Griffith, Esq., Paradise House, Newnham, Cambridge. A Corydalis from the Himalayas, which grows 5–6 inches high and has flowers of a bright sky blue.

Cymbidium × 'Dorchester' var. 'Vera Salmon.' **A.M.** April 26, 1938. This vigorous plant bore an erect spike of 9 large flowers, which are white with mauve-pink shading on the sepals and petals and around the front lobe of the labellum. *C.* × *Alexanderi* × *C.* × 'Tityus.' Exhibited by R. J. Salmon, Esq., Woodslee, Houndsden Road, Winchmore Hill, N. 21.

Daphne collina. **A.M.** March 29, 1938. From Mr. A. N. Griffith. An Italian species having corymbs of sweet-scented light mauve flowers with lanceolate leaves set with fine hairs.

Draba mollissima. **A.M.** March 29, 1938. From Dr. Giuseppi, Trevose, Felixstowe. A Caucasian species which forms a small rounded cushion of light green hairy foliage, the flowers being large for the genus and of a bright golden colour.

Erica ventricosa var. superba. **A.M.** April 26, 1938. From Lionel de Rothschild, Esq., Exbury. A free-flowering Cape Heath of compact, bushy habit. The waxy flowers are ½ inch long, tubular with spreading petal-tips, pale pink, deepening towards the base.

Erysimum capitatum. **A.M.** March 29, 1938. From Miss E. A. Britton, Washfield Nurseries, Tiverton, Devon. A species from California having clusters of 12–16 very fragrant cream flowers on 4–7 inch stems.

Fritillaria latifolia nobilis. **A.M.** March 29, 1938. From Dr. Giuseppi. Originates from Jugoslavia and Greece and has lanceolate leaves, and large pendulous flowers, mottled maroon and yellow, which spring from 2–3 inch stems and almost touch the ground.

Hydrangea 'Hatfield Rose.' **A.M.** April 26, 1938. From Messrs. S. Low, Enfield. A useful market variety bearing medium-sized trusses of large deep rose-red flowers.

Iris Wattii. **A.M.** April 5, 1938, as a tender plant. This is the true *Iris Wattii*, the plant which received **A.M.** in 1925 was *Iris confusa* Sealey. Flower stems over 3 feet tall, branches carrying forty to fifty flowers, foliage less abundant than in *I. confusa*. Standards, 1½ inch long by ¾ inch wide, soft lavender-lilac, almost horizontal, margins wavy. Falls, 1⅝ inch long, 1⅜ inch wide, straight hanging, soft lavender-lilac, with violet-blue spots near haft, in a creamy-white ground. Style branches semi-erect, crest large, fringed, soft lavender-lilac. Exhibited by Lord Aberconway, Bodnant, North Wales.

Ledum nipponicum. **A.M.** March 29, 1938. From Alpine Nurseries Ltd. A neat little Japanese shrub with evergreen foliage and compact heads of pure white stellate flowers.

Lithospermum oleifolium. A.M. March 29, 1938. From Mrs. Gwendolyn Anley, St. George's, Woking. Comes from Spain and is a particularly handsome low-growing species with bright green spatulate leaves and rather large medium blue flowers.

Lithospermum prostratum 'Grace Ward.' A.M. April 5, 1938. From Gardens Department, Dartington Hall Ltd., Totnes, S. Devon. Very similar to the type in habit and foliage. The flowers are of a rather darker shade of blue than 'Heavenly Blue' and of the same purity and brilliance.

Malus hupehensis var. rosea. A.M. April 5, 1938. From the Director, R.H.S. Gardens, Wisley. A very ornamental Crab, forming a shapely tree with somewhat erect branches. The medium-sized flowers are carried in clusters of six, and have bright red calyces and blush-pink petals stained externally with rose.

Narcissus 'Balmoral.' A.M. April 12, 1938, as a variety for exhibition. A fine, large, well-poised *Incomparabilis* variety (Division 2A), with exceptionally broad segments. The chrome-yellow flower, in which the corona was of a slightly deeper shade than the perianth, was 4¾ inches in diameter, borne on a stout 21-inch stem. The smooth segments were 1⅞ inch long, the outer ones being no less than 2⅛ inches broad. The neat corona was just over 1¾ inch long, expanding gradually towards the mouth, which was 2⅛ inches in diameter. Raised by the Brodie of Brodie and shown by Mr. J. L. Richardson.

Narcissus 'Carbineer.' F.C.C. April 5, 1938, as a variety for exhibition. This shapely bicolor *Incomparabilis* variety, raised by Mr. A. M. Wilson and shown by Mr. J. L. Richardson, received an **A.M.** as a variety for exhibition on April 14, 1931. See JOURNAL, R.H.S. **57**, p. xliv.

Narcissus 'Cardigan.' A.M. April 12, 1938, as a variety for exhibition. A beautiful bicolor *Incomparabilis* variety (Division 2B), with flowers 4¼ inches in diameter, well-poised on 23-inch stems. The white, smooth, broad overlapping perianth segments were 1¾ inch long, the outer ones being 1⅞ inch broad. The funnel-shaped buttercup-yellow corona, which contrasted well with the perianth, was 1⅜ inch long and 1½ inch in diameter at the mouth. Raised by Mr. A. M. Wilson and shown by Mr. J. L. Richardson.

Narcissus 'Cromarty.' A.M. April 12, 1938, as a variety for exhibition. A self-coloured buttercup-yellow Trumpet variety (Division 1A), with flowers 4¼ inches in diameter, well-poised on stout 18-inch stems. The smooth perianth segments were about 1¾ inch long, the outer ones being nearly as broad, and the corona was about 1⅞ inch long and reflexed at the margin, where it was 2 inches in diameter. Raised by the Brodie of Brodie and shown by Mr. J. L. Richardson.

Narcissus 'Dreamlight.' A.M. April 26, 1938, as a variety for exhibition. Flowers 3 inches in diameter, well-poised on slender 15-inch stems. The white, smooth perianth segments overlapped,

the outer ones being 1 5/16 inch long and of the same width. The corona, which was ¾ inch in diameter and less than ¼ inch long, was white, passing to green at the centre, and was edged with fire-red. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Dunlewey.' **A.M.** April 12, 1938, as a variety for exhibition. A well-proportioned, self-coloured, greenish-white, *Leedsii* variety (Division 4A), with flowers 4½ inches in diameter, borne on stout, 17-inch stems. The smooth perianth segments were nearly 2 inches long, the outer ones being about 1¾ inch wide. The funnel-shaped corona was 1¼ inch long and 1½ inch in diameter at its indented margin. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Hawera.' **A.M.** April 12, 1938, as a variety for the alpine-house. A pretty, rapidly-increasing, free-flowering hybrid between *N. triandrus* and *N. Jonquilla* (Division 5), bearing on 10- to 11-inch stems, two, three, or occasionally four, pale canary-yellow, pendent flowers. The reflexing perianth segments were ¾ inch long and ⅜ inch broad. The cup-shaped corona was ⅜ inch long and ½ inch in diameter at the mouth. Raised in New Zealand by Mr. W. W. M. Thompson and shown by the Director, R.H.S. Gardens, Wisley.

Narcissus 'Larne.' **A.M.** April 12, 1938, as a variety for exhibition. An attractive, bicolor *Incomparabilis* variety (Division 2B), with flowers 4¾ inches in diameter, well-poised on 17-inch stems, The smooth, greenish-white perianth segments were just over 2 inches long, the outer ones being 1⅞ inch broad. The primrose-yellow corona was 1¾ inch long and 2⅛ inches in diameter at its expanded, frilled mouth. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Rathkenny.' **A.M.** April 12, 1938, as a variety for exhibition. A bicolor Trumpet variety (Division 1C), with flowers 4⅜ inches in diameter, well-poised on 18-inch stems. The greenish-white perianth segments were 1⅞ inch long, the outer ones being just over 1½ inch broad. The bright chrome-yellow trumpet was approximately the same length as the perianth segments, and about as much across its expanded mouth. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Silver Wedding.' **A.M.** April 12, 1938, as a variety for exhibition. A greenish-white *Leedsii* variety (Division 4A), with a flower 4½ inches in diameter, so poised downwards as to make an angle of 45 degrees between the corona and the 16-inch stems. The smooth, rather narrow perianth segments were 2 inches long, the outer ones being not quite 1½ inch broad. The narrow tubular corona was about ⅛ inch shorter than the perianth segments and reflexed at the margin. Raised and shown by Mr. Guy L. Wilson.

Narcissus 'Sincerity.' **A.M.** April 12, 1938, as a variety for exhibition. A bicolor Trumpet variety (Division 1C), with flowers nearly 4½ inches in diameter, borne in a slightly pendent position on 16-inch stems. The smooth, greenish-white perianth segments were 1¾ inches long, the outer ones being about as much across. The prominent primrose-yellow corona was nearly 2⅛ inches long and 1⅞ inch across its expanded mouth. Raised by the late Dr. N. Y. Lower and shown by Mr. Guy L. Wilson.

Olearia Gunniana splendens 'Downton.' **A.M.** April 26, 1938. From Mrs. H. W. Hall, Lymington. Of the coloured varieties of this attractive half-hardy Tasmanian shrub, that exhibited was one of the finest. The large branches bore such an abundance of deep mauve-pink Daisies as practically to conceal the foliage.

Orobus vernus roseus splendens. **A.M.** April 5, 1938. From Mr. Ernest Ladhams, Elstead Nurseries, Godalming. Flowers rich cerise at the base with a white margin, growing in racemes on 6–8 inch stems. Leaves pinnate, leaflets narrow and acute.

Phyllodoce caerulea. **A.M.** March 29, 1938. From Mr. R. B. Cooke, Corbridge, Northumberland. Flowers large pendulous bells of a light pink on slender foot-stalks, which spring from the tips of 5–6 inch shoots. Foliage bright green. The typical form from its Norwegian habitat.

Phyllodoce caerulea, Japanese form. **A.M.** March 29, 1938. From Mr. R. B. Cooke. A smaller form from Japan in which the bells are dark pink, the foliage darker than in the type and the shoots 2–3 inches in height. It appears to be somewhat more floriferous than the type. A very handsome little plant.

Phyllodoce nipponica. **A.M.** March 29, 1938. From Messrs. W. E. Th. Ingwersen Ltd., East Grinstead, Sussex. A prostrate Japanese species having small pink-tinged white bells on delicate foot-stalks growing from the tips of 4–5 inch stems which, like the calyx, are purplish.

Pieris floribunda var. elongata. **A.M.** April 5, 1938. From Mr. W. J. Marchant, Wimborne. This very fine variety was raised from seed collected in Georgia, U.S.A., and is quite distinct from the type plant. The time of flowering is some weeks later, the flowers are larger and the panicles longer, in some cases attaining a length of 8 or 9 inches. It is stated by the exhibitor to have the merit of coming true from seed.

Primula Calderiana. **A.M.** March 29, 1938. From Mr. R. B. Cooke. An umbellate species from Sikkim bearing a few rich purple flowers, with a small central zone of a deeper colour, growing on 6-inch stems. The leaves are large and ovate, rich green and of a soft woolly texture.

***Primula 'E. R. Janes.'** **A.M.** April 1, 1938. Raised by Mr. Lawrenson of Newcastle-on-Tyne and sent by Messrs. M. Prichard, Christchurch. Plant compact, of *P. Juliae* habit, 2–3 inches tall. Flowers borne either on single stems or six to ten flowers on stem 1¼ inch diameter, rich rosy-salmon with a cupreous sheen; eye medium size, yellow, pin-eyed. Free-flowering.

Primula kisoana. **A.M.** March 29, 1938. From Lt.-Col. C. H. Grey, Hocker Edge Gardens, Cranbrook, Kent, and Mr. A. N. Griffith. A Japanese Primula which has light mauve long-tubed blooms, with green centres and a woolly calyx, on 4–5 inch downy stems. The leaves are bright green, being undulate and serrated.

***Primula 'Nancy Lansdell.'** **A.M.** April 1, 1938. Raised and sent by Mr. F. Lansdell, Brighton. A primrose of compact habit, 5 inches tall, very free flowering. Flowers borne singly on 4-inch stems above the foliage, 1⅛ inch diameter, deep rich crimson-purple; eye small, pin-eyed, golden yellow.

Primula veris macrocalyx. **A.M.** March 29, 1938. From Mr. A. N. Griffith. A variety of Cowslip with bright yellow flowers on 6–7 inch stems, and light green rough spatulate leaves.

Prunus subhirtella pendula fl. pl. **A.M.** April 5, 1938. From Collingwood Ingram, Esq., Benenden. A beautiful Japanese Cherry with slender, weeping branches bearing numerous clusters of small, double flowers, crimson in the bud and opening to deep, rich pink.

Rhododendron × **'Aries.'** **F.C.C.** April 5, 1938. Shown by Lionel de Rothschild, Esq., Exbury House, Southampton, as a hardy flowering plant. A cross between *R. neriiflorum* and *R. Thomsonii*, with trusses about 6 inches wide by 3 inches deep of up to ten open-campanulate clear, deep scarlet flowers, the corolla 3 inches wide by 2¼ inches deep, the lobes slightly notched; calyx the same colour as the corolla, about half as long, with irregular lobes. The thin ovate leaves are slightly mucronate, obtuse, glabrous, and pale below. **A.M.** May 3, 1932. (See JOURNAL R.H.S., **58**, xxxvii.)

Rhododendron × **'Avalanche'** **F.C.C.** April 5, 1938. From Lionel de Rothschild, Esq. A cross between *R. calophytum* and *R.* × *Loderi*, shown as a hardy flowering plant for the woodland garden. This hybrid received an **A.M.** on April 17, 1934, and is described in the JOURNAL, R.H.S., **59**, 357.

Rhododendron × **'Avalanche' var. 'Alpine Rose.'** **A.M.** April 5, 1938. Shown by Lionel de Rothschild, Esq., as a hardy flowering plant for the woodland garden. This variety differs from the type (see above) in its slightly larger trusses and flowers and its charming delicate pink flowers.

Rhododendron desquamatum, Forrest's var. (F. 24535). **A.M.** April 5, 1938. Shown by Capt. A. M. Talbot Fletcher, Margam Castle, Port Talbot, Glamorganshire, as a hardy flowering plant. Sprays from five different plants raised from Forrest's seeds were shown, exhibiting five different shades, from clear pale mauve to reddish-mauve, the reddish speckling on the corolla also varying. A fine form of the species.

Rhododendron × **'Fortune.'** **F.C.C.** April 5, 1938. A hybrid between *R. Falconeri* and *R. sinogrande*, shown by Lionel de Rothschild, Esq., as a hardy flowering plant for the woodland garden. Large, compact, globular trusses about 9 inches wide by 7 inches deep, of twenty-five to thirty campanulate flowers, clear yellow with a small crimson splash within at the base of the tube, translucent, the large disc-shaped green stigma exserted. The large leaves, shiny above, are slightly bullate and covered with a fawn tomentum beneath.

* After trial at Wisley.

Rhododendron × **'Gay Lady.' A.M.** April 5, 1938. From Lady Loder, Leonardslee, Horsham, Sussex. A hybrid between *R.* × 'Cornubia' and *R. Griffithianum*, with large globular trusses about 9 inches across by 8 inches deep of fifteen or so deep rose, funnel-shaped flowers, up to $3\frac{3}{4}$ inches wide by 2 inches deep. The thin leaves are ovate, glabrous, and obtuse at each end.

Rhododendron × **'Rosalind.' A.M.** April 5, 1938. Shown by Lord Aberconway, Bodnant, N. Wales, as a hardy flowering plant. A hybrid between *R. Fargesii* and *R. Thomsonii*, with loose trusses about 7 inches across by $5\frac{1}{2}$ inches deep of widely funnel-shaped rose-pink flowers, and rather small glabrous, ovate leaves, slightly cordate at the base, obtuse at the apex, dull green above, pale below.

Rhododendron Williamsianum. A.M. April 5, 1938. A hardy flowering plant for rock garden and general garden use, from Lord Aberconway. The large, pink, open bell-shaped flowers are in clusters of two or three at the tips of the branches. The small leaves are almost round, cordate, mucronate, glabrous, dark green above, very pale below. A low, floriferous shrub.

Schizocodon macrophyllus. F.C.C. April 5, 1938. From Mr. W. J. Marchant, Keeper's Hill Nursery, Stapehill, Wimborne. A very healthy and well-grown plant with rich pink fringed flowers carried on 6–8 inch stems with bronzy-green leaves. This plant received an **A.M.** in 1924.

Sedum spathulifolium 'Capablanca.' A.M. March 29, 1938. From Alpine Nurseries Ltd. A North American plant which grows in a neat low clump of spatulate fleshy leaves, which are covered with a grey-blue bloom, smaller than the type.

Shortia uniflora grandiflora rubens. A.M. March 29, 1938. From Mr. W. J. Marchant, Keeper's Hill, Stapehill, Wimborne. A cross from two pink forms of *Shortia uniflora grandiflora*, giving flowers of a lovely rose-pink colour. Suitable for a cool shady position in woodlands.

Sophora macrocarpa. A.M. April 5, 1938. From Lord Aberconway, Bodnant. While sufficiently hardy to be grown in the open without protection in favoured localities, this choice evergreen shrub will generally be found to require shelter. The branches are well clothed with dark green, pinnate leaves 3 to 4 inches in length, and the bright yellow, pea-shaped flowers, each about 1 inch long, are produced in short, clustered racemes.

BOOK REVIEWS.

" Glass in Architecture and Decoration." By Raymond McGrath and A. C. Frost. Royal 4to. 664 pp. (The Architectural Press, 1937.) £3 3*s*.

This most interesting and valuable book gives a comprehensive survey of the history, manufacture and uses of glass. It also contains a section by H. E. Beckett on the nature and properties of glass.

Of chief interest to horticulturists is the section " Glass in Architecture," which gives a history of the use of glass in gardens at home and abroad and illustrates the gradual development of the greenhouse, conservatory and winter garden. Here the remarkable career of Joseph Paxton is recorded in some detail, and interesting particulars are given of the design and construction of his masterpiece, the Crystal Palace. The authors draw particular attention to the significance of this building, and claim that although it may have been regarded by some as a Victorian monstrosity, in reality it compared advantageously with any exhibition building of the twentieth century, its architectural qualities having been those which many modern architects are deliberately attempting to achieve. The authors suggest that Paxton was largely responsible for the cult of the conservatory, but they overlook the fact that English horticultural builders were constructing them in great numbers and on a large scale as early as the beginning of the nineteenth century. They also suggest that the books of William Robinson advocating the growing of hardy plants seriously affected the erection of conservatories and greenhouses. Such, however, was the rapid growth and enthusiasm for horticulture at that period that this was not by any means the case. While more recently there may have been a falling off in the construction of the old type of conservatory as an adjunct to the house, in general, horticultural building is in a very flourishing condition and is very far from declining, as the authors seem to imply.

Horticultural builders may also resent the suggestion that one must nowadays go to the Soviets to find workers who compare in industry with those who glazed the Crystal Palace. Judging by the figures given, these are regularly surpassed by many present-day workmen.

The authors very pertinently remark that the failure of many glazed horticultural structures was due to the design having been entrusted to engineer-architects. From the examples of modern winter gardens and conservatories which are given, it is clear that there is still a lack of co-operation between the architect and horticultural expert. Those illustrated, while aesthetically attractive, seem to provide conditions far from ideal for the plants which they are to contain.

In general, however, the book is a most fascinating one, beautifully produced and full of information and statistics relating to glass. The illustrations (some 400 in number) are exceptionally good and include striking photographs of the Crystal Palace at Sydenham, taken just prior to the fire which destroyed it. In descriptive matter in connexion with these, the authors state that the park and pleasure grounds of the Crystal Palace were the work of its gardener-architect Joseph Paxton, but in the interests of accuracy it should be pointed out that the greater part of the grounds was laid out by Edward Milner.

Among other illustrations worth mentioning, which may help to give some idea of the extent of the field covered by this book, are those showing the various processes of glass manufacture; prints and photographs of ancient and modern buildings, showing the progression of window design; pictures of glass mosaics, mirrors, glass-silk boiler insulation, motor-car crashes, and the Mersey Tunnel with its facing of black glass.

In addition, there are many technical photographs illustrating effects of reflection, transmission and diffusion of light in connexion with various types of glass.

J. E. GRANT WHITE.

" Bee-keeping." Bull. 9. Ministry of Agriculture. Ed. 6. 8vo. 56 pp. (H.M. Stationery Office, London, 1937.) Paper covers, 1*s*.

This useful pamphlet has now reached its sixth edition, and contains clear instructions for the care and treatment of the honey-bee.

" A Review of the Literature on Stock-Scion Incompatibility in Fruit Trees." By G. K. Argles. Tech. Com. 5. 4to. 115 pp. (Imp. Bur. of Fruit Production, 1937.) Paper covers, 5*s*.

The title conveys the contents of this excellent review, which gives in brief the results of grafting Apples, Pears and the different stone fruits in various parts of the world and under varying conditions. A full bibliography is given and two tables, one showing the root-stocks used for Pears with the results obtained, and the other for various types of Plum.

" How to Grow Roses." By J. H. McFarland and R. Pyle. Ed. 18. 8vo. 192 pp. (Macmillan, New York, 1937.) 4*s*. 6*d*.

The names of the authors of this new edition of a well-known book, now rewritten, are sufficient guarantee of the reliability of the text. It is to be regretted that some of the names of new Roses raised in Holland and mentioned and illustrated do not conform to the rules laid down for the naming of new garden-raised plants, and it is to be hoped that rose-growers the world over will set their faces against the use of names irregularly formed or unnecessarily changed.

" Mother Earth." By G. W. Robinson. 8vo. vii + 202 pp. (Murby, London, 1937.) 5*s*. 6*d*.

The chapters of this book are cast in the form of letters addressed to Professor Stapledon, and are written in a style which makes much of the recent ideas concerning the soil, its origin, varieties and treatment, intelligible to the general reader unfamiliar with the prodigious number of new technical terms with which the new soil science so often bristles. It has an appeal perhaps beyond the cultivator, for the soil is the basis of wealth, and it can be read with great advantage by every gardener and farmer who desires to know the most recent ideas as to how the fertility of the soil can be maintained and improved.

" The Gardens of Taphrobane." By Count de Mauny. Ed. by B. Miall. 8vo. 320 pp. (Williams & Norgate, London, 1937.) 15*s*.

A very pleasant book with delightful descriptions of scenery and life in the island, as well as the story of the making of a very charming garden. Tropical plants have a great attraction, and Count de Mauny seems to have a very comprehensive collection of all the best. The chapters on individual species are excellent, and not the least interesting is the account of Raman, the Cingalese gardener, who seems as keen on the plants and garden as his master. The chapter about *Amherstia nobilis* is sad reading. It is such a lovely tree when it can be grown, but it is always difficult to get it started. The house on this island at the south of Ceylon sounds most attractive, and the illustrations are excellent.

LADY BEATRIX STANLEY.

" Chrysanthemums of Japan." By Feizo Niwa. 8vo. vi + 56 pp. + 80 + 20 pl. + iv pp. (Allen & Unwin, London, 1937.) 12*s*. 6*d*.

This work on the Chrysanthemum was printed in Japan and says little in regard to the cultivation of the " Golden Flower." It is most carefully written and embraces quite a lot of matter that is most interesting, and the work is beautifully illustrated.

It is written chiefly for the benefit of growers in Japan, and in consequence will appeal only to those who take an interest in the Chrysanthemum from a scientific or historical point of view.

The author begins by inquiring, " What are Chrysanthemums ? " and roughly divides them up into two classes, *i.e.* wild Chrysanthemums and cultivated Chrysanthemums, explaining that the former are limited to white and yellow, and says nearly all their flowers are single ; while the latter exhibit almost any colour except blue. Therefore the horticulturist mainly concerns himself with the cultivated Chrysanthemums.

Professor Niwa's classification of the Chrysanthemum is interesting and in a manner quite different from that recognized in European countries.

A chapter is devoted to the " Kind of Petals," which goes to show that the author has spent much time in considering the many and various types of petals represented in the Chrysanthemum as we know it to-day.

Interesting matter relating to the "Kind of Leaves" is written, and this is amplified in "Impressions of Chrysanthemum Leaves" in quite a large number of plates in green.

The physical and chemical properties of Chrysanthemums are dealt with at considerable length—as the author remarks, "with a view to clarifying just what sort of organization and constituents a matured Japanese Chrysanthemum possesses, and also to supplying a fundamental knowledge which is indispensable for the cultivation of Japanese Chrysanthemums."

Professor Niwa advances views in regard to the history of the "cultivation and development of Chrysanthemums in Japan" which are new to those who follow the cult in England. He says no one can give any definite reply, for want of reliable evidence, to the question whether the Chrysanthemums cultivated in Japan are indigenous to that country. He infers that "cultivated Chrysanthemums must have been brought over from China, after they had attained to a certain degree of development, in some year in the Era of Tempyo of the Nara Period (724–749 A.D.)." The author goes on to say, "It is back to the Heian Period that we can clearly trace their cultivation. There has been found an ode on Chrysanthemum flowers recited by the Emperor Kwammu at an Imperial banquet in October of the 16th year of Euryoku (797 A.D.)—an evidence of the plant's having been cultivated so early in the history of Japan." He states further that "according to books on Chrysanthemums published about the Shotoku and Kyoho eras (1711–35 A.D.) it might be said that Japan had already witnessed in this period remarkable development in Chrysanthemum cultivation —a development no other country in the world could have ever attained." Japanese Chrysanthemums were cultivated in Holland about the year 1688, and later in 1789 Chinese Chrysanthemums passed into France, and in 1862 the Japanese Chrysanthemum migrated into England. "The Origin of Chrysanthemums" is contained in a chapter bristling with facts and figures of much interest, far too lengthy, however, to consider in this brief review. The author concludes his researches with the question, "What, then, is the origin of Chrysanthemums? It is impossible at present to give a scientific answer to this question—the author has been making some experiments and investigations by cultivating as many as thirty thousand stocks of wild Chrysanthemums, but he has not yet arrived at any results worthy of publication."

There are some eighty pages of Chrysanthemums in colour, with pages of descriptive text interleaved. Some of the illustrations are very beautiful, but we fear the varieties figured would not be appreciated by growers in this country. The Pompons, however, show that this country is behind Japan, and growers would be well advised to procure some of the better sorts from that country. This work should be in the library of every lover of the Chrysanthemum.

D. B. CRANE.

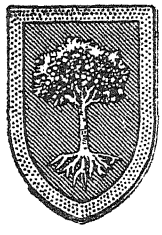
"Weeds of Arable Land." By H. C. Long, I.S.O., B.Sc. Bull. 108. Ministry of Agriculture. Ed. 2. 8vo. v + 215 pp. (H.M. Stationery Office, London, 1938.) 4*s*.

This useful account of weeds of cultivated lands and the methods of dealing with them in agriculture has been revised, and now includes information regarding some of the newer weed killers such as sodium chlorate and calcium cyanamide.

"The Farming Year." By J. A. Scott Watson. 8vo. 128 pp. (Longmans, London, 1938.) 7*s*. 6*d*.

In spite of its title this interesting, well-written, well illustrated and well-produced book contains something of horticulture, for there is something of vegetables and flowers, something of what the author calls "farming under glass," which is, of course, properly called horticulture, and something of fruit-growing.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXIII  Part 7

July 1938

FORTHCOMING EVENTS, ETC.

THE Conference on Ornamental Flowering Trees and Shrubs at which a great number of interesting subjects were discussed, for example, the use of Flowering Trees and Shrubs on Walls and in Rock Gardens and under various climates, and such groups of trees and shrubs as Cherries, Brooms, Cotoneasters, Camellias and Magnolias, was obviously a welcome event in the Society's activities as judged by the large number of Fellows who took part in it, and by the very interesting discussions which took place.

The excursions to the gardens of Mrs. W. J. H. WHITTALL at Grayswood Hill, near Haslemere, and Mrs. W. MOSENTHAL at Tittenhurst, Sunninghill, were also well attended and those making these visits appreciated the opportunity of also visiting under guidance the Royal Botanic Gardens at Kew as well as the Society's Gardens at Wisley.

The papers and the discussions are now being prepared in book form, and an announcement as to its publication and price will be made shortly. Applications for this volume should be sent to the Secretary.

The Council desires to express its gratitude to all those who took an active part in the Conference, be it as Chairman of the sessions, readers of papers, participators in the discussions, or owners of gardens.

The Chelsea Show of 1938 is now past history. In spite of the unprecedented weather against which the gardener has had to struggle, and in spite of its inclemency during the Show, the Show was an undoubted success: the attendance was larger and the exhibits up to the last hours fresher than usual.

The general average of the exhibits was very high and the arrangement of the two large marquees, first tried last year for the Coronation Show, proved its value.

Their Majesties The King and Queen, Queen Mary, Their Royal Highnesses The Duke and Duchess of Gloucester, The Duke and Duchess of Kent, The Princess Royal and other members of the Royal Family, as well as Her Majesty the Queen of Norway, again honoured the Society with their presence.

The Council is grateful to all the exhibitors, to the Committees who assisted in the judging, and to the Fellows and their friends for helping to make the Show such a successful gathering.

Particulars of the awards made at Chelsea will be found on pp. xciii–c.

On July 12 (1 P.M.–7.30 P.M.) and July 13 (10 A.M.–5 P.M.) the National Carnation and Picotee Society will hold their Show in the Old Hall.

The particulars of the first Fortnightly Show in July were given in the June number of the JOURNAL, and the next Fortnightly Show will be that of July 19 (12 noon–7.30 P.M.) and July 20 (10 A.M.–5 P.M.). On this occasion there will be held the following competitions :—

for Lilies :

(*a*) A Banksian Medal is offered for award to the amateur who exhibits at the Fortnightly Show on July 5 and 6, or the Fortnightly Show on July 19 and 20, the best hybrid Lily which has not received a Certificate of Preliminary Commendation, an Award of Merit, or a First Class Certificate beforehand.

(*b*) 1 stem of Lilium, cut or on plant.

for Roses :

The Clay Challenge Cup is offered for the best scented rose. For further particulars of this competition see January JOURNAL, p. 32.

The entry forms for these three competitions are obtainable from the Secretary and should be returned to him not later than by the first post on Wednesday, July 13.

On July 19, at 3.30 P.M., in the Lecture Room of the New Hall, a lecture will be given by Mr. D. B. CRANE on " Violas and Pansies."

At Wisley on July 20 and 21 (2 P.M.–4 P.M., weather permitting) a demonstration will be given on the Summer Pruning of Fruit Trees and Shrubs. Fellows desirous of attending this demonstration are requested to inform the Director of the Gardens of the day they intend to be present.

At the Fortnightly Show on August 9 (12 noon–7.30 P.M.) and August 10 (10 A.M.–5 P.M.) there will be a competition for the Foremarke Challenge Cup which is offered for 20 spikes of named Gladioli in not fewer than 10 varieties and not more than 2 spikes of any one variety. The Cup was presented to the Society by Sir FRANCIS BURDETT, Bt., in 1919.

There will also be a competition for Gladioli, the first prize of which is a silver card salver presented by Mrs. H. W. HALL. The classes are as follows :—

Class A.—6 varieties of Gladioli, 1 spike of each. Other things being equal, preference will be given to the exhibit with the largest number of open flowers.

Class B.—6 varieties of Gladioli, 1 spike of each. Other things being equal, preference will be given to the exhibit with the largest individual flowers.

Entries for these two competitions must be made on special forms obtainable from the Secretary to whom the completed forms must be returned not later than by the first post on Wednesday, August 3.

On August 24 and 25 (2 P.M.–4 P.M., weather permitting) there will be a demonstration at Wisley on the Vegetative Propagation of Plants. The Director of the Gardens will be glad to know of those desiring to attend this demonstration at an early date.

International Horticultural Congress.

The Twelfth International Horticultural Congress will be held in Berlin from August 12 to August 17. It bids to be an interesting one in view of the comprehensive programme which has been prepared, covering all horticultural subjects. The Society is sending a deputation to the Congress. Any Fellows interested in this Congress are asked to write as soon as possible for particulars from the Secretary, Dr. Guenther, Twelfth Internationaler Gartenbaukongress, Schliefenufer 21, Berlin, N.W. 40, Germany.

General Examinations.

The following are the results of this year's General Examinations held on March 8, 1938.

Seniors.

Seven hundred and eight candidates entered for this Examination, and of these

12 were placed in Class 1.
113 ,, ,, ,, ,, 2.
273 ,, ,, ,, ,, 3.
266 failed.
44 were absent.

A Silver-gilt Medal is awarded to Miss Audrey Sybil Jones, of Hill View Poultry Farm, Upton-on-Severn, Worcs, who was First.

Juniors (under 18).

Two hundred and fifty-one candidates entered for this Examination, and of these

33 were placed in Class 1.
46 ,, ,, ,, ,, 2.
47 ,, ,, ,, ,, 3.
121 failed.
4 were absent.

A Silver Medal is awarded to Mr. James Carruthers, of the Herts Institute of Agriculture, Oaklands, St. Albans, who was First.

British Floral Art Diploma.

The written examination will be held on Wednesday, August 31, at various examination centres; the practical examination will be held in the Town Hall, Torquay, on Wednesday, September 28, and Thursday, September 29. The holding of the practical examination in the provinces is an experiment in order to try to encourage florists in the provinces to enter more freely for the examination, and if successful the future arrangements will be for the Spring Examination to be held in London, and the Autumn Examination in the provinces.

The Rhododendron Conference.

After very careful consideration of the effects of the weather as well as other circumstances, the Council in conjunction with the Rhododendron Association has decided to postpone the Rhododendron Conference to 1940, as it was felt that every step should be taken to ensure that the exhibition to be held in connexion with the Conference should be as great a success as the Conference itself, and the present prospects due to the late frosts are not favourable for 1939.

Autumn Show.

Would Fellows kindly remember that there will be no Autumn Show owing to the impossibility of obtaining suitable accommodation this year.

Wisley in July.

Among the trials and standard collections in flower this month there will be much of interest to visitors: Sweet Peas, Border Carnations, Sidalceas, Gladioli, Dimorphothecas, and dwarf varieties of Godetia. These are all to be found in the trial grounds on the left side of the main Rose walk, close to the entrance gates. Other features on this hillside are the Roses in the broad borders traversing it from east to west, and the annuals facing the Pear orchard beside the path leading to the Alpine house. In the Alpine house at this time of the year there is little to be found in bloom, but there are the Campanulas, of which so many flower comparatively late in the season, the Japanese *Conandron ramondioides* and *Thalictrum kiusianum*, and outside the house in the adjoining beds are a number of varieties of Gazania opening widely in sunshine, of which perhaps 'Sunfire' and 'Sunbronze' are the most striking in brilliancy of hue. On the rock garden visitors will find a greater variety of plants in flower, including the earliest of the creeping blue-flowered Cyananthus, the late *Primula Littoniana*,

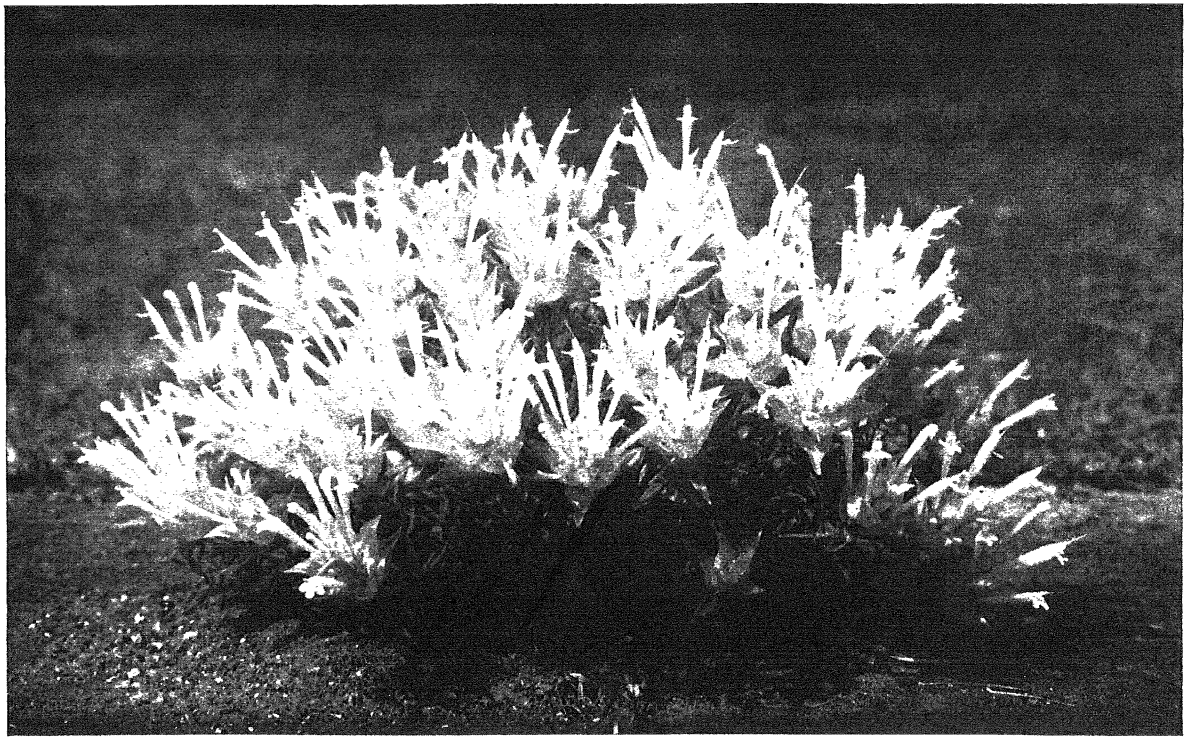


FIG. 71.—THYMUS MEMBRANACEUS.
(A.M. 1930.)

[*To face p.* 304.



FIG. 72.—FRITILLARIA GLAUCOVIRIDIS.

various species of Linum, Nierembergia, and Geranium, besides *Gentiana gracilipes* (*Purdomii*), *Platycodon grandiflorum*, commonly called the Balloon Flower, pink *Convolvulus althaeoides*, and the brilliant little *Mimulus* 'Whitecroft Scarlet,' so happy in damp places.

In the shade of the Wild Garden the Lilies will be either in bloom or approaching that state, and while there will not this year be many stems of the huge *Lilium giganteum*, compensation may be found in *L. Willmottiae*, *L. Davidi*, *L. Duchartrei*, *L. amabile* and others. Here too *Primula Florindae* bears its soft yellow scented flowers by the ditch side, in delicate contrast to the taller, pale blue *Campanula lactiflora* behind it, whilst elsewhere are the spires of *Meconopsis napaulensis* (*Wallichii*) in blue or purple tones, and the long white bells of *Campanula latifolia alba*.

In the open spaces of Seven Acres the Heather garden is seen to be regaining colour after the flush of spring species with the different summer-flowering Heaths, of which *Erica cinerea* is the most important member in the number and variation of its forms, although aided by those of *E. Tetralix*, the Cross-leaved Heath, which however prefers marshy to dry positions in opposition to the former. Above these lowly plants grow the Spanish and Mount Etna Brooms—*Spartium junceum* and *Genista aethnensis* respectively—and another excellent species is *G. cinerea* with the additional merit of being sweetly scented.

In the ponds here and elsewhere are Water-lilies suitable for varying depths of water and ranging in colour from white and cream to pink and rose-red. Few of the shrubs in this part of the Gardens bloom now, but there are some of the Spiraeas, Cotoneasters, Deutzias, Philadelphus, and the invaluable *Hypericum patulum Forrestii* which continues for many weeks in August. In Howard's Field, near to the river walk, the numerous species of Rosa and many of the old-fashioned roses continue to be of interest and beauty for a long period, some by reason of their flowers, others for the fruits beginning to colour towards the end of this month.

On the return from this end of the Gardens the visitor should walk up the herbaceous border and note the progress made by the many plants there, newcomers as well as the best of the older sorts; probably the end of July is one of the best seasons to see this border, although it continues to be decorative and an attraction for many weeks to come. The tall *Spiraea venusta magnifica* is always outstanding in July, both for its height and the massive heads of soft pink bloom. It may also be seen in the Award of Garden Merit garden, where another valuable plant is the red *Helenium* 'Moerheim Beauty.' Nearby is the paper-white *Deutzia Monbeigii*, distinct in its small grey leaves, compact habit and quantity of blossom.

In the large Temperate House notable plants are *Solanum Wendlandii* trained up one of the supports of the roof, the pale blue shrubby *Plumbago capensis*, pink semi-double Oleander (*Nerium Oleander*) and various types of Fuchsias, especially varieties and hybrids of

F. triphylla with coloured foliage and rosy or vermilion flowers. Amongst the many plants in the Half-Hardy house, which is that nearest to the laboratory, the African Delphiniums, *D. macrocentron* and *D. Welbyi*, are very noticeable for their height and colour, as is the scarlet *Rochea coccinea* of much lower stature, while the shrubby rather tender *Pentstemon antirrhinoides*, bearing pale yellow hooded blossoms, is in curious contrast to the tubular rosy-red flowers of *P. isophyllus* against the wall outside this house.

NEW PLANTS FOR THE ROCK GARDEN.

By G. W. Robinson, F.R.H.S.

[Read February 8, 1938; F. C. Stern, Esq., F.L.S., in the Chair.]

On the face of it my title to-day seems a reasonably easy subject for discussion, yet on reflection it has its pitfalls.

Firstly, for how long is a plant to be regarded as new? For our present purpose I suggest that we take a period of about ten years and say it is no longer new after it has been in cultivation for that time. Within the last ten years many large and interesting collections of seeds have been received, not only from the well-known collectors, but also from smaller expeditions and travellers in various parts of the world, people whose work does not always receive the credit it deserves. From the East have come species native to the Himalaya (including Tibet), China and Japan. From the Southern hemisphere we have had collections made in South America, Tasmania, and New Zealand, while North America has contributed material from the Far West, the Rocky Mountains, and from the Eastern Appalachian Range.

Now comes my second and, perhaps, even more important question: How many plants out of all those collections can I regard as having passed their tests and become permanent inmates of our gardens?

Many have already fallen by the wayside and have been eliminated either because they have proved inferior to plants we already have, or owing to difficulties of cultivation.

On looking over my list of probables one other question arises: this is whether or not to include as new, plants which for some reason had dropped out of use or been lost, and have recently been reintroduced; and some at least of these, I think, I shall be justified in including.

As is to be expected, the Western European Flora has given us relatively little new material in recent years. The most outstanding plant is, I think, *Thymus membranaceus*, collected by Mr. Ashton Lofthouse in the Sierra Nevada of Spain. This is an altogether distinct type of Thyme with tight little mounds of twiggy growth, completely covered in late summer with papery white bracts in addition to long-tubed white flowers. Unfortunately it has not proved very hardy, but propagation by cuttings is easy and well worth the little trouble involved. An excellent subject for cultivation in pans for the alpine house, it provides flowers and interest after the majority of alpines are over. It received the **A.M.** when shown by Mr. Lofthouse in 1930 (fig. 71).

We have also to thank this collector for *Campanula affinis* (syn. *C. Bolosii*), which he collected in the same region. It is about 18 inches high, with flowers of varying shades of blue. Usually it behaves as a biennial, but it can and does sometimes continue until the third year.

From the same country has come *Linaria faucicola*, which also gained the **A.M.** A prostrate plant, with clear violet flowers, it is typical of the genus Linaria. Though naturally a perennial it is not long-lived; it usually seeds freely, however, and can be propagated in early autumn by cuttings. For its introduction we are indebted to Dr. ROGER BEVAN, who collected it in 1929. To him also we owe the introduction of a very fine form of *Campanula arvatica*, differing from the typical plant in being larger and tending to run about above ground rather than below the surface. A delightful albino of this species recently collected by Mr. B. W. FAGAN was, I believe, a case of beginner's luck. In the capable hands of Messrs. C. ELLIOTT it is now being distributed.

Campanula Allionii is, of course, an old garden plant, but again there have been several really excellent forms received in recent years. Firstly, there is a clear white variety, and, secondly, the pink form discovered by Mr. BARKER on Mont Cenis; both have received the **A.M.** and both deserve it.

Before going further eastwards, it will be convenient to slip across the Strait of Gibraltar and see what collectors have been doing in North Africa. Mr. E. K. BALLS has himself given us the story of his experiences and plant discoveries in the Atlas Mountains, so I will mention only one or two of his plants here.

Narcissus Watieri is one of the purest and daintiest of early spring flowering bulbs. It was first introduced and shown by Mr. G. P. BAKER, and has since been obtained in larger quantities by Mr. BALLS. Arising from tufts of narrow grey-green foliage, the flowers are white with a very short broad corona. This is a lovely little species for the alpine house and will undoubtedly become a popular plant.

From the same habitat comes *Colchicum triphyllum*, which was also introduced a year or so ago by Mr. BALLS. It has, as its name suggests, three leaves, and each corm produces in summer half a dozen or more white or very pale mauve flowers. It was given the **A.M.** when shown in February 1937.

Campanula Broussonettiana is, in my opinion, one of the brightest little annuals of recent times. It was introduced by Kew in 1933 from seed collected in Morocco. It is erect in habit, and some 4 to 6 inches high, with thin wiry stems terminating in bright violet tubular flowers.

Another valuable Mediterranean plant is *Sternbergia lutea angustifolia*. This variety is not new, but is only now becoming generally known. It is rather taller than the type and freer flowering, and like it requires a hot and dry position.

The Balkans and the countries to the south and east of the Black Sea are noted for their wealth of plants suitable for our rock gardens, and particularly for Monocotyledons.

Fritillaria Drenovskyi is surely one of the daintiest and most attractive of recently introduced plants; it is a native of Macedonia, first collected in 1931 by the Bulgarian naturalist after whom it is



FIG. 73.—CYANANTHUS INTEGER.
(**A.M.** 1934.)

[*To face p.* 308.



FIG. 74.—PRIMULA EUCYCLIA.
(**A.M.** 1930.)

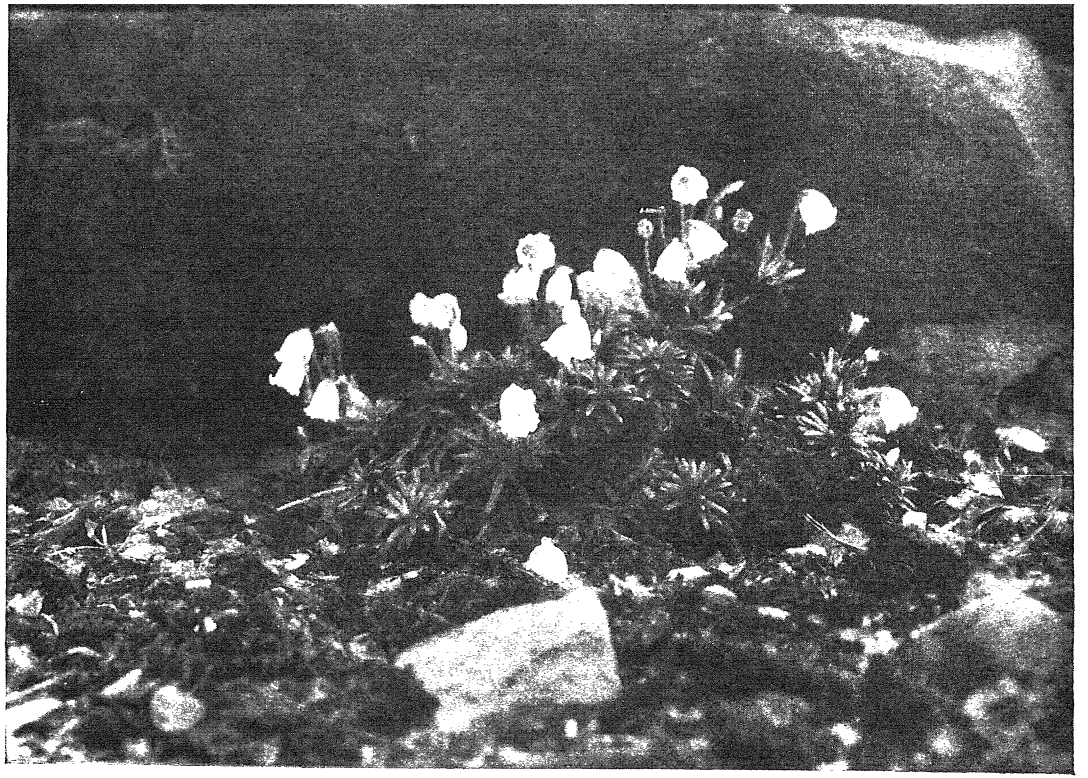


FIG. 75.—PHYLLODOCE NIPPONICA.
(**A.M.** 1938.)

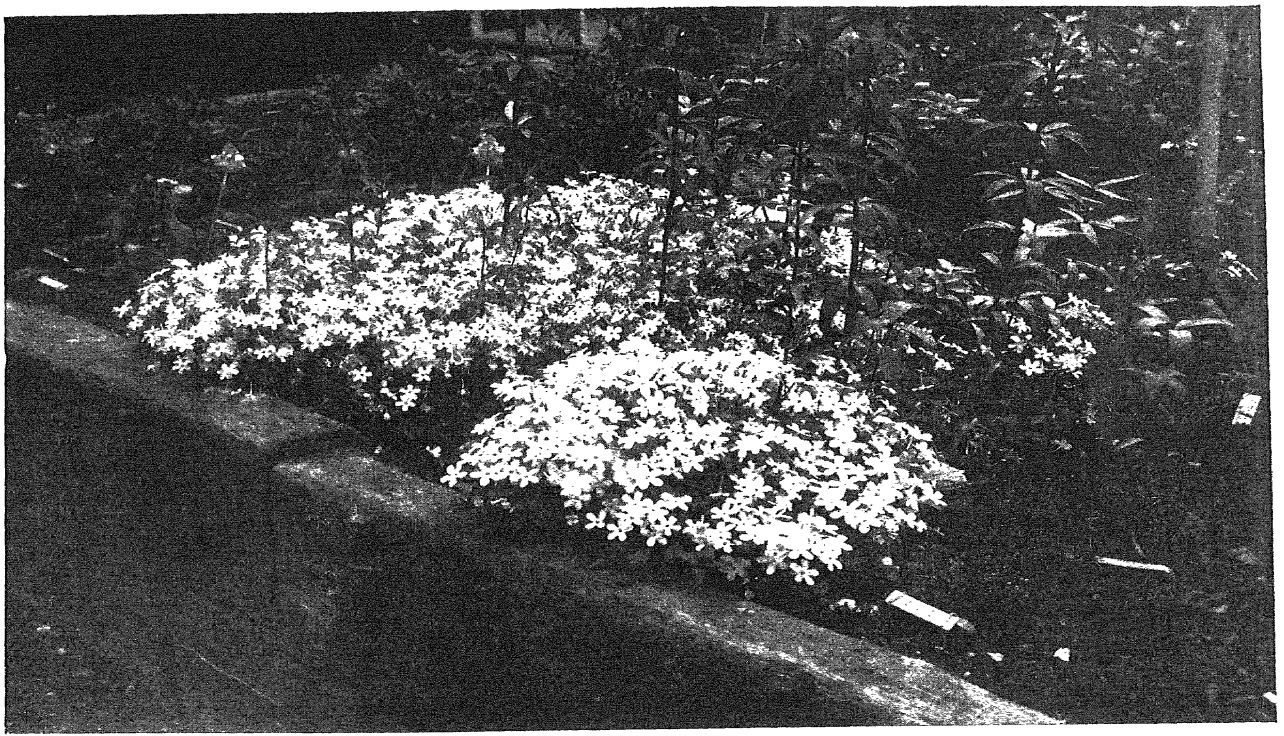


FIG. 76.—PHLOX ADSURGENS.
(A.M. 1932.)

[*To face p.* 309.

named. Possessing a light and graceful habit, it is about a foot high, with narrow greyish foliage and yellow flowers which are suffused with purple on the outside.

F. dasyphylla and *F. glaucoviridis* (fig. 72) are two interesting new plants, though their greenish colouring is less attractive. *F. dasyphylla* is of solid texture and remains in flower for a long time. *F. Karelinii*, from Persia, though it has been known in Botanic Gardens for many years, is only now coming into general cultivation. It is curious in its structure, which is so distinct from the usual type that it has been given generic rank under the name Rhinopetalum. Growing only some 6 inches high, its open flower and pink or lilac colour suggest a Nomocharis rather than a Fritillaria.

Iris Winogradowii is found only in a limited area in western Central Georgia, and though it first flowered at Glasnevin in 1927, it is by no means common. While it differs in some minor details from *I. reticulata*, it is from a garden standpoint a yellow counterpart of that species; it has the same four-angled leaves and type of bulb.

An excellent new plant from Greece is *Hypericum empetrifolium prostratum*. The type, which is erect-growing, has been in cultivation for many years and this plant is identical in its floral parts, but has a densely matted prostrate habit. The interesting feature is the fact that the plant was known botanically over a hundred years ago, and was figured in SIBTHORP's Flora Graeca in 1833.

Jankaea Heldreichii is, of course, by no means a new plant, and it is doubtful if it has any right to be included here at all. It is, however, only within the last few years that it has been obtainable in any quantity. It has now proved its merit, and has been successfully grown out of doors with only a sheet of glass for protection in winter.

Another first-class plant from the Balkans is *Geranium subcaulescens*; it is one of the most vividly coloured of all alpines, being at its best an intense glowing carmine with a jet black centre. It has a dwarf tufted habit only a few inches high and with relatively large flowers; by no means a difficult plant, it requires only a well-drained situation and plenty of sunshine. It was discovered in 1929 in Serbia.

Campanula Poscharskyana is a valuable and free-flowering species, its one fault being that it is inclined to be invasive. It is semi-prostrate in habit and has wide open lavender bells with pointed lobes. The plant was distributed by Mr. INGWERSEN, who received his seed from Serbia.

C. betulaefolia was shown for the first time last year at Chelsea, so has yet to prove itself. It is well-named, having rosettes of birch-like leaves, glabrous and with long slender petioles. The flowers may be white or pink in colour. It is a native of Armenia.

A third Campanula and with a dreadful name is *C. Choziatowskyi*, but it is a plant of graceful habit and suitable for alpine house cultivation. Only a few inches high, it produces numerous sprays of tubular blue flowers. It is a native of the Caucasus region.

The species of Cyananthus are all native of the mountains of India, West China and Tibet, and provide a valuable race of rock garden plants, as they flower from July and August onwards when colour is most desirable.

C. lobatus is an old garden plant, having been known and grown since 1845, but the fine form introduced by Capt. KINGDON WARD, and for some years grown under his number K.W. 5949, is far superior and worth its place in any garden. It is one of the glories of northern gardens, in particular in early autumn, and amply justifies its new varietal name—*insignis*. Probably the easiest of the genus, it has long procumbent stems which bear in profusion brilliant purple-blue flowers almost 2 inches in diameter.

C. integer is another lovely little plant which has lately attracted a good deal of attention. It has the same trailing habit as the last named, but is much smaller and has less fleshy foliage. The stems are covered about August with lovely deep blue flowers an inch or so across. A native of the Kumaon Hills, N.W. Provinces of India, it was first raised and flowered at Wisley from seed received from Mr. E. A. OSMASTON (fig. 73).

C. longiflorus is another of the most beautiful species in the genus. It has mats of silvery foliage from which it sends up in autumn large tubular flowers almost 2 inches in length. Though it was first found by ABBÉ DELAVAY, and again by FORREST in 1906, it is from the latter's later expeditions that our present stock is derived. Though not an easy plant in most gardens, it can be grown well in the more humid parts of Britain; it requires peat or leaf mould with a little loam and plenty of sand and grit for efficient winter drainage.

Codonopsis is an allied genus which is interesting botanically, but cannot claim to be popular. This is partly owing to their fœtid odour, and partly because in most species the bell-shaped flowers hang down and hide the most interesting feature, the colours and markings on the interior of the bell. They are perennials, most of them having a rambling or climbing habit. Quite a number of species are in cultivation in Botanic Gardens. The pale blue *C. Bulleyana* was found and named by FORREST, who also collected many of the other species.

Gentiana Szechenyi is the name we must now use for the plant collected by Capt. KINGDON WARD under number K.W. 10765. It was at first thought to be *G. Georgei* and was shown at the same meeting by both Lord ABERCONWAY and Major STERN in June 1936, when it received the **A.M.**

Whatever opinions one may hold on the relative merit of the various Gentian species, it can be safely said that *G. ornata* is one of the most interesting introductions of recent years. The plant had been known botanically a hundred years, and several species had usurped its name before it was shown in 1930 in this Hall and immediately given Botanical and Cultural Certificates; a year later it received the **A.M.** Its history was written by Mr. T. HAY (who was responsible for its introduction) in the Gardeners' Chronicle of

September 1930. There are several other new introductions in Asiatic Gentians, but I question whether they are as good as those which are familiar to us. *G. gilvostriata*, another of the *ornata* type, will, I think, remain in cultivation. It is of cushion-like habit, with small grey leaves, and the flower is almost as good as *G. sino-ornata* itself. It was found and introduced by Capt. KINGDON WARD and first shown in 1935.

Hybrids of these Asiatic species are now becoming so numerous, and many so good, that it is not easy to select a limited number. One of the oldest and best of these is *G.* × *Macaulayi* (*G. Farreri* × *G. sino-ornata*). It was given the **A.M.** in September 1931 and described in the Gardeners' Chronicle of October 31 of that year.

G. × *stevenagensis* (*Wellsiana*) (*G. sino-ornata* × *Veitchiorum*) is of more recent date, and many of you will remember that the hybrid was raised by two independent growers about the same time. The cross *G. hexa-Farreri* (*Farreri* × *hexaphylla*), raised by Mr. G. WEEKS, is another first-class plant worthy of a place in any collection. More recently still we have Mr. HARLEY'S hybrid *G. ornata* × *sino-ornata*, which received the **A.M.** from the Joint Committee last September, and has been appropriately named 'Glendevon.'

In the genus Primula there have been so many interesting and valuable introductions in recent years that one scarcely knows where to begin (or to leave off).

Certainly one of the loveliest is *Primula scapigera*, which has been so well shown in this Hall during the past year. It is one of the Petiolaris group closely related to *P. Winteri*, but differing in having its foliage without meal and in other minor details. The deep lilac flowers have a white ring and a yellow eye. A native of Sikkim it has been found at altitudes of 7,000 to 13,000 feet. It has certainly come to stay and is no more difficult to grow than are its allies *P. Edgeworthii* and *P. Winteri*. *P. Edgeworthii* can also be included here as a new species, for the true plant was not seen in cultivation until 1933, when it was shown in this Hall by Mr. HAY and given the **A.M.** In the same group botanically is *P. sonchifolia*, one of the most interesting introductions of recent years. Found first by DELAVAY and again by later collectors and well known from dried material, all attempts to introduce it failed until 1931. Early in that year plants were sent in the frozen dormant state to Mr. HAY. These flowered in February and received the Silver Lindley Medal of the R.H.S. Later the same year, plants were flowered which were raised from seed forwarded in a vacuum flask by Sir CHARLES INNES in 1929. Though beautiful in flower its foliage is inclined to be coarse, and sad to say it is most difficult to keep through the summer months in southern England.

Many of the new species have the hairy rosettes of foliage which so dislike our damp climatic conditions, and others for various reasons have not done well in cultivation.

While I must mention a few of the more outstanding plants, some are, I fear, for the expert only or for those with particularly favoured

gardens. A first-class plant is *P. Wigramiana*, which was named by Sir WILLIAM WRIGHT SMITH in honour of Lady WIGRAM. It was collected in July 1931 by Col. K. N. SHARMA at Sherkathan in Nepal, and first shown by Mr. HAY in 1934, gaining the **A.M.** Closely related to *P. nutans*, it shares its dislike of our cold damp winters, and though it is easy enough to raise from seed, it is less easy to carry through the winter to maturity. It bears a compact umbel of flowers, some 6 inches high, milky white, both the scapes and flowers being mealy.

P. Wollastonii is an allied species with purple or deep blue flowers from E. Nepal. It was discovered in 1921 by the late Dr. A. R. F. WOLLASTON, Medical Officer and Naturalist on the Everest Expedition of that year. In 1931 seed was collected by Major LAL DHWOJ and forwarded by H.H. the Maharajah of Nepal to His Majesty King George V. Plants were first flowered in April 1932, also by Mr. HAY. Like *P. Wigramiana* the basal rosettes are difficult to winter. This species also has been recently figured in the Botanical Magazine (t. 9401). In the same group as these two species (the Soldanelloides) is *P. Sherriffae*, one of the most curious and interesting of all Primulas; it looks tender and sub-tropical, yet it has been successfully cultivated in cold frames and alpine houses. The leaves are large and hairy and the scape some 4 to 6 inches high, bearing pale-violet corollas with curved tubes about 2 inches long. It was first found in June 1934 in S.E. Bhutan by Capt. GEORGE SHERRIFF and shown in September 1935 by Mr. HAY. The following year it gained the **A.M.**

P. rotundifolia is the type plant of a section the members of which are all difficult to keep in cultivation, particularly in the south; they require cool humid conditions in summer. It was flowered and shown in 1932 from seed collected in Nepal.

P. eucyclia has been in cultivation some years, but is by no means common. It is a curious and interesting little plant of the Cortusoides group, with pink flowers and fringed segments, a native of Tibet (fig. 74).

P. Rockii is an entirely different type of plant. Like its allies *P. Forrestii* and *P. Dubernardiana* it is a good perennial. It also shares their appreciation of an open well-drained compost containing lime rubble. It is quite distinct in colour, being deep yellow, the centre tinged with brown, and makes an excellent alpine house plant.

There have been several new plants in the Chamaejasme group of Androsace. From a botanical point of view the most interesting is the true *Androsace sarmentosa* of WALLICH, which was collected by Major LAL DHWOJ in Gossan Than, Nepal, in the exact locality from which WALLICH described this species. It has loose open rosettes, with a tangle of thick dark red stolons and scapes some 6 inches high, with umbels of lilac flowers. It was received under several numbers, but the most successful was No. 11 of the 1931 collection, which is still in cultivation. Unfortunately it has not proved as easy as *A. sarmentosa* of gardens.

In spite of the fact that they are large for the average rock garden,



FIG. 77.—IRIS RETICULATA 'ROYAL BLUE.'
(**A.M.** 1936.)



FIG. 78.—CROCUS CHRYSANTHUS 'YELLOWHAMMER.'

[*To face p.* 313.

no review of recent years could omit a reference to the genus Meconopsis, and particularly to *Meconopsis regia*. Though the large soft yellow flowers are themselves beautiful, the plant is worth growing for its foliage, which is one of the loveliest things out of doors during late winter and early spring. It was first discovered in W. Nepal in 1928 by Major LAL DHWOJ; the following year he obtained seeds which flowered in Britain in 1931. It gained the **A.M.** when shown in that year by Mr. HAY.

Collected at the same time was another cream-coloured species with delicate fern-like foliage. This was fittingly named after its collector *M. Dhwojii*, and was described so recently as 1932 by Mr. TAYLOR; later the same year it was figured by Mr. HAY (both in the Gardeners' Chronicle).

One of the most beautiful genera of recent introduction is without doubt Nomocharis. GEORGE FORREST was responsible for the collection of large quantities of seed of these delightful plants. *Nomocharis Mairei* is marked like an orchid, with blotches of rose to purple colouring on a white ground. The inner three segments are broader and fringed. It is usually some 18 to 24 inches high, with flowers fully 3 inches in diameter. *N. saluenenis* is one of the most variable in colour; generally it is a deep rose on the outside and white within. It is erect in habit and as much as 3 feet high. While they are by no means difficult to raise, a constant guard against both slugs and mice is necessary, as both these pests are particularly fond of them.

Corydalis cashmiriana has attracted a great deal of attention in recent years. My own experience with it has been disappointing, for raising from imported seed one gets a high proportion of poor-coloured forms bordering on magenta and not worth growing. If, however, a good one can be obtained, such as the lovely blue one owned by Mr. H. B. TUNNARD which was figured for the Botanical Magazine, it is worth all the praise which has been so lavishly bestowed on it. Even when not in flower the bright green compound foliage is both graceful and attractive. A small tuberous-rooted perennial the plant is native to temperate Himalaya from Kashmir to Sikkim, where, we are told, it grows in open stony ground and moist places between 10,000 and 14,000 feet.

Japan has provided us with many lovely plants and a number of curious genera, some of which are extremely puzzling to the botanist. Amongst the daintiest of Japanese plants are the small Ericaceae, particularly Cassiope and Phyllodoce. *Cassiope lycopodioides* is a delightful little plant, with tiny imbricate leaves and a creeping prostrate habit. In spring it produces its graceful little white bells like the flowers of Lily of the Valley. *Phyllodoce nipponica* (fig. 75) is more erect in habit and some 3 or 4 inches high, with linear recurved leaves. The white campanulate flowers are borne in terminal clusters in April. These are two of the choicest of new alpines and require similar cool, moist growing conditions and peaty compost.

Ranzania japonica is of particular interest botanically, as it belongs to that peculiar group of plants usually dumped in Berberidaceae, but so completely different from the type genus as to make one wonder why. It is allied to Podophyllum, a genus which is now separated from Berberidaceae by some botanists. The large lilac flowers are developed in April before the leaves unfold, and the young foliage itself is quite decorative. It is fleshy-rooted, and if grown for the alpine house display it requires a large and deep pot.

Glaucidium palmatum is another interesting Japanese monotypic plant. Having been variously placed in the families Ranunculaceae and Berberidaceae, it now finds itself in the new Podophyllaceae. It has large solitary pale lilac flowers consisting of four petaloid sepals and a central cluster of yellow stamens. Flowering in April and May, it requires a cool peaty root run. It has recently been figured in the Botanical Magazine (t. 9432). It can be grown in pots in cold frames and brought into the alpine house for its decorative young foliage and flowers.

One of the best of the cluster-head type of Gentian is *Gentiana Makinoi*. It is a native of the mountains of Central and Northern Japan and flowers in August and September. Erect in habit, and a foot or more high, it has terminal clusters of clear violet-blue flowers. It is named in honour of a noted Japanese botanist, Mr. G. MAKINO of the Imperial University of Japan.

From Japan also come the Tricyrtis or Toad lilies; these are valuable for their late flowering qualities and long season. The flowers are wax-like in texture and of peculiar shape. *Tricyrtis hirta* is probably the best-known species, and two interesting new species are *T. kotoensis* and *T. formosana*; in all these the ground colour is white, flushed and blotched to a varying extent with purple. *T. affinis* is also new, but is less attractive in colour.

From western N. America, the home of that lovely genus, we have two new Phloxes, *Phlox adsurgens* and *P. bifida*. *P. adsurgens* (fig. 76) is without question one of the most beautiful plants of recent introduction. It has the usual trailing habit of the alpine phloxes, broad dark-green leaves, and in May and June it covers itself with soft clear pink flowers some 4 or 5 inches in height. In the drier parts of the country it dislikes full sun and does best in a cool half-shady position and a leafy or peaty compost. It is from Oregon and N. California. *P. bifida* is from the prairies of Illinois and Missouri; it is of more tufted habit, not unlike the well-known *P. subulata* varieties, but stronger growing and with larger foliage. It was introduced by Kew in 1933 and was at first treated as an alpine house plant; it has since been grown in the rock garden and has survived two winters. As with many other plants, however, it is better to raise young stock annually. There are two colour forms, white and pale violet. The specific name is appropriate, as the petals are so deeply cut as to suggest that the flower has ten segments.

I may be charged with omitting one of the loveliest of all,

P. mesoleuca, but I am not quite sure that it is easy enough to justify inclusion.

Another equally important genus from a rock garden standpoint is Pentstemon, and the best of these are all from the Western States. To my mind the best of the recent introductions is *Pentstemon Barrettae*, which forms a spreading bush a foot or so high and 2 to 3 feet through. There are two distinct colour forms in cultivation, both excellent plants; one has deep green foliage and soft purple flowers, while the other has silvery-grey foliage and flowers of a more lilac shade. Though the plant is perfectly hardy it requires a sheltered situation, as it starts into growth in February, and this growth is liable to be caught by cutting winds. It comes from the hills above the Hood and Columbia rivers near their confluence, where it was first collected by the lady after whom it is named.

P. Cardwellii is similar in habit to *P. Scouleri*, with shorter and broader glossy evergreen foliage. The flowers are variable in colour, pale violet being most common, while some forms tend to pink; there is also a freak form in which the corolla is split to the base. *P. Crandallii* has been highly praised by several American growers, but has not as yet distinguished itself under our climatic conditions. It is also an evergreen species, with a dwarf spreading habit and narrow linear leaves. The flowers are freely produced and upturned. With us the colour is best described as purplish-blue, though two American writers call it "clearest turquoise."

Synthyris rotundifolia var. *Sweetseri* is not only new to our gardens, but is a new plant botanically, as it was only described and named in 1930. It was found a year or so previously in Josephine County, Oregon, by the botanist who named it, in company with Professor SWEETSER of the University of Oregon, after whom it is named. It is an excellent little spring-flowering plant, particularly useful for the alpine house.

Also a native of Oregon is *Kalmiopsis Leachiana*, one of the most interesting small shrubs of recent introduction. Unknown until 1930, it was discovered in that year by the lady whose name it bears. The following year it was described as a Rhododendron, and in 1932 was given separate generic rank. The name is apt, as it closely resembles a small Kalmia both in habit and in size and shape of flower. A dwarf compact evergreen growing a foot or so high it has umbels of pink flowers in May and June.

From the Olympic Mountains also comes *Campanula Piperi*, which has only been established in Britain during the past few years. It is a useful little prostrate species with wide-open pale blue flowers. It should be planted in crevice, wall, or scree, or grown in pans for the alpine house. It was given the **A.M.** when shown in July 1932.

Lewisia brachycalyx, though new to gardens generally, can only claim to be a reintroduction, as it was in cultivation at Kew in 1875. It was evidently lost within a few years, but was again introduced to Kew in 1934. It will, I think, remain in cultivation, as it is so distinct

from the better-known pink-flowering species. The foliage is a spreading rosette of dark green spatulate leaves, which form an excellent foil for the large white flowers. It is as easy to grow as its allies, and is particularly useful for alpine house display.

Also from Oregon is *Iris innominata*, which ranks high in the list of new plants. The plant is very variable in colour, and in addition to the rich orange form now fairly common, there is a lavender-flowered form in cultivation. The rather paradoxical name is due to the fact that until quite recent years it was botanically unnamed. The leaves are very narrow and wiry, a foot or so in height, while the solitary flowers rarely exceed 6 inches.

Several N. American species of Fritillaria have been introduced recently. *Fritillaria Purdyi* has large open bells, greenish in colour, and flecked with purple and with white tips or margins. It is from Humboldt County, California. *F. glauca* is similar, but has flowers of a more yellowish-green and flecked with brown; the corolla lobes are also more open and recurving. *F. liliacea*, though not a new plant, is only now becoming generally known; it has relatively small white flowers, differing from the usual habit of the genus in its open saucer-shaped flower. It is a native of California, from San Francisco southwards.

One of the best rock garden plants from the Eastern States, and certainly one of our best yellow flowering plants, is *Kneiffia* (*Oenothera*) *linearis*. There are few, if any, brighter coloured plants for summer and autumn. It is native to the hot and dry parts of Virginia, Florida, and Louisiana, and, as this fact suggests, it revels in a hot sunny spot. It is sometimes listed as *O. riparia*, which is a taller growing, more erect species.

Before crossing the Atlantic, we must visit Central America, the home of *Weldenia candida*; this cannot be claimed as a new plant, having been introduced to Kew so long ago as 1893, and flowering the following year. It is, however, only recently that there have been any number available. The most interesting feature of this plant is the fact that it is found in Guatemala and Mexico within 15 or 20 degrees of the equator. Though it is reasonably hardy it is best grown as an alpine house plant, as the beauty of its clear white flowers is soon lost; though the individual flowers are so fugitive it is wonderfully prolific and flowers over a long period. There are two distinct forms in cultivation, one having glabrous and the other more or less hairy foliage.

So far we have confined our attentions to the Northern hemisphere; now let us glance at a few of the interesting plants from south of the line.

Though we have had many new plants over from South Africa in recent years, few of them have as yet proved their value for outdoor cultivation in Britain. The best of these exceptions is probably *Rhodohypoxis Baurii*. Though it has actually been grown under glass for many years in Botanic Gardens, it was not until it was discovered

quite recently that it is relatively hardy that the plant became generally known. It is a perennial plant with a short rhizome, from which arise narrow strap-shaped leaves and scapes some 4 inches high and rosy-red in colour. The white-flowered variety *platypetala* is equally hardy, and both are likely to become popular plants. The white-flowered form of *Lapeyrousia cruenta* has proved to be surprisingly hardy, and is a lovely little bulbous plant.

Though we have recently had large quantities of seed from New Zealand, few of the species are new to cultivation.

Some of the white flowering Gentians have recently become popular; of these, *Gentiana saxosa* is probably the best; it has loose sprawling scapes of cup-shaped flowers each about half an inch across. *G. bellidifolia* is taller and more erect, but smaller both in foliage and flowers. Both these plants like a cool corner in a leafy compost, and are safest with a sheet of glass over them in the winter, as they dislike our cold damp conditions.

A newcomer which might be best described as a botanical curiosity is *Gunnera Hamiltoni*. When one thinks of Gunnera it is instinctively of the magnificent South American species, *G. manicata* and *G. chilensis*; what greater contrast can be imagined within a genus than between these and the tiny foliage and prostrate creeping habit of the New Zealand species. Though a native of the South Island and Stewart Island it has not proved very hardy and requires the protection of a sheet of glass in winter. First found and recorded in 1884, it does not appear to have been tried in Britain until 1930, when plants were sent to Kew by Dr. COCKAYNE. It bears scarlet fruits.

Gentiana scarlatina was collected by Miss STAFFORD in S. Peru in 1932. When dried material of a scarlet and yellow Gentian was first shown it created a great sensation, but the plant has not, unfortunately, done as well as one could wish under cultivation. It forms tufts of deep green lanceolate leaves, about 3 inches long, from which arise flower scapes some 4 to 6 inches high; the flowers do not open out widely but remain almost globular. They have stripes or bands of scarlet on a bright yellow ground colour. Though easy to raise from seed, it is by no means so easy to get through the winter, and is best grown in pans which can be given the protection of cold frames.

One of the most fascinating of South American plants is *Calceolaria Darwinii*. This was introduced by Mr. CLARENCE ELLIOTT, who collected seed near Punta Arenas (now renamed Magallanes), the most southerly town in South America. It attracted considerable attention when first shown at Chelsea by Sir WILLIAM LAWRENCE in 1928. The leaves suggest a plantain, but the large solitary flowers are most striking with gold pouches splashed with crimson and marked by a prominent white band. *C. tenella*, also from South America, is worthy of a place in any rock garden where it can be given a cool sheltered corner. From a prostrate carpet of bright green foliage 2-inch stems arise bearing a number of clear yellow flowers marked with brown

old orchard, known locally as Knight's Orchard, containing still a few cherry trees of a very great age (fig. 83). In 1931 a careful examination was made of the few remaining trees, which were then in fruit. One or more were certainly the variety 'Elton,' and others closely resembled in leaf and fruit characters the varieties 'Waterloo' and 'Black Eagle.' We have it on KNIGHT'S authority that 'Elton' and 'Black Eagle' were raised from seeds sown in 1806, while he was still living at Elton, and 'Waterloo,' a similar cross to 'Black Eagle,' must have been raised very soon afterwards, since it fruited for the first time shortly before the battle to which it owes its name. It is therefore possible that the oldest of these trees were actually planted by KNIGHT himself.*

In 1795 KNIGHT first became acquainted, through his brother, with Sir JOSEPH BANKS, then President of the Royal Society. In April of that year he read his first recorded paper to the Royal Society, on the Grafting of Fruit Trees, and in July of the following year began the correspondence with BANKS which was to last for close on twenty years.† From this moment the real figure of THOMAS ANDREW KNIGHT begins to emerge: at the age of thirty-five he stands revealed as a man of tremendous energy, experienced in all forms of farming, and with a large circle of acquaintances in Herefordshire and the surrounding counties. But above all he was now, and had been for some years, an indefatigable experimenter in all kinds of subjects connected with plant and animal life. In his first letter to BANKS he discusses plant and animal breeding, and describes his early attempts in crossing peas. In his second letter he sends specimens of aphis, and samples of one of his new pea seedlings, and gives his views on inbreeding in relation to dwarfing. And in his third letter he speaks of sending more pea seedlings by coach together with a "microscope slider" of a new pest of corn. In 1797 he took an active part in starting an agricultural society in Herefordshire, and in later years had much to do with the improvement of Herefordshire cattle. In 1799 he wrote a letter of thanks to Sir JOSEPH BANKS for having procured for him the present of a Merino ram from the Royal herd. In this same letter he writes for the first time about the ascent of the sap in trees, a subject which was destined to lay the foundation of his reputation as a plant physiologist.

What can have come over this extraordinary young man after all these years of silence, to induce him to write a letter of nearly 2,000 words on this or any other subject? KNIGHT gives the answer at the beginning of the letter: "If I become a troublesome scribbler to you, I must claim your pardon on the ground that you have made me such";

* A cross-section of the trunk of one of these trees is now in Hereford Museum, and a young tree raised by grafting a scion from one of them has recently been planted at Balliol by Mr. C. S. ORWIN, whose brilliant Life of KNIGHT'S cousin, KNIGHT of Exmoor, was published in 1930 under the title of The Reclamation of Exmoor Forest.

† The writer is indebted to Mr. J. RAMSBOTTOM, Keeper of Botany, British Museum (Natural History), for permission to read the Banksian correspondence.

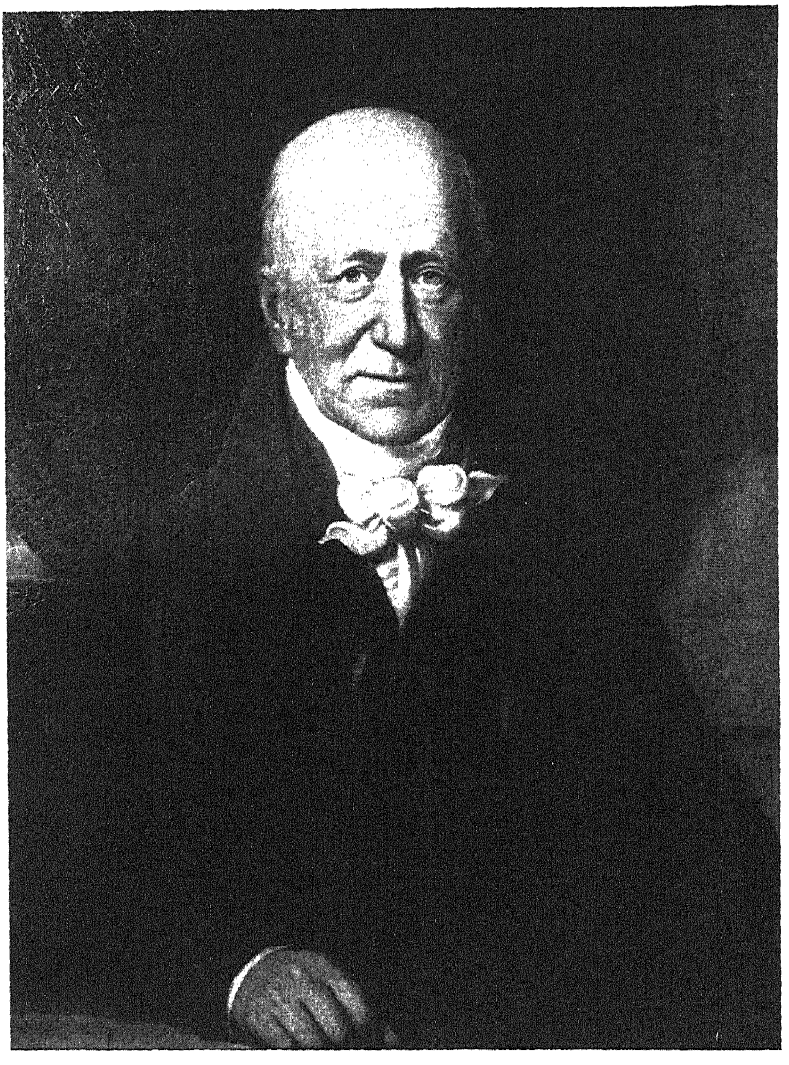


FIG. 79.—THOMAS ANDREW KNIGHT.
President, Horticultural Society of London, 1811–1838.
From a portrait in Downton Castle.

[*To face p.* 320.

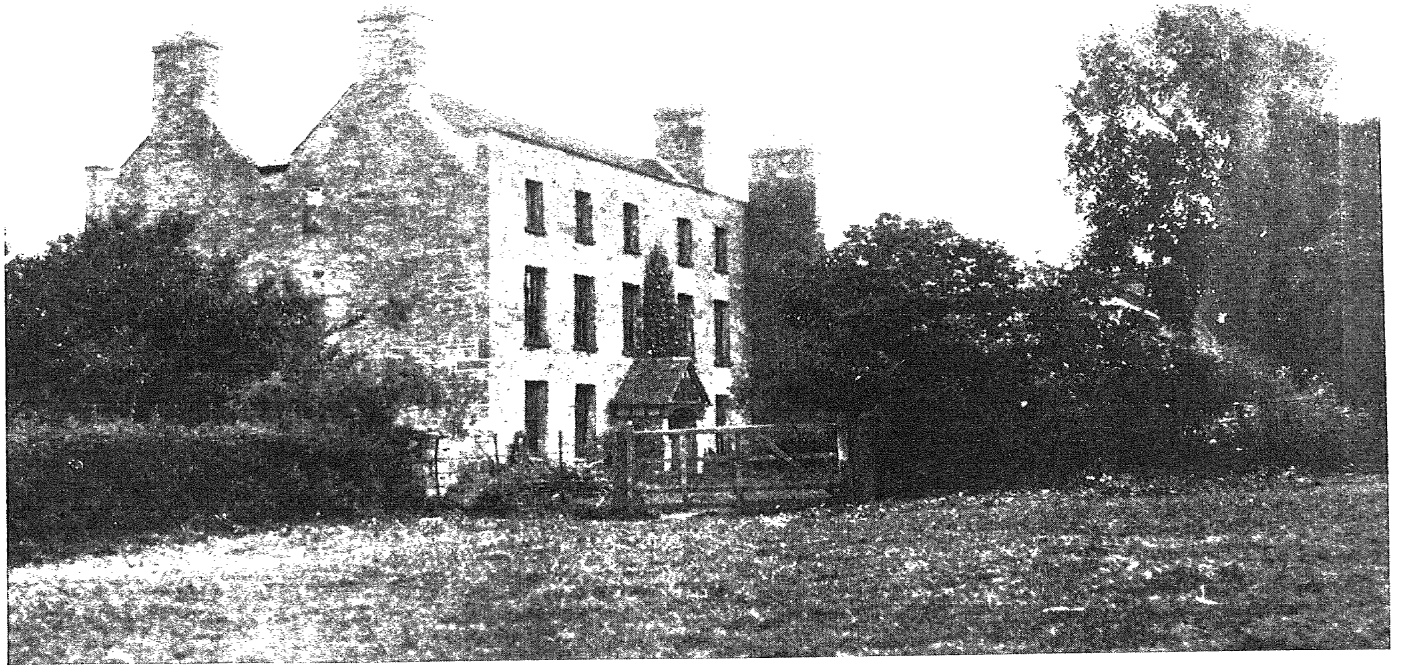


FIG. 80.—WORMSLEY GRANGE, HEREFORDSHIRE.
Birthplace of T. A. Knight.

for without the attention I have been honoured with from you, I am certain I should never (in print) have scribbled at all."

And indeed in estimating KNIGHT'S contribution to science it is important to bear in mind the extraordinary influence which Sir JOSEPH BANKS exerted upon him. A lesser man might never have drawn him from his natural reserve, and would certainly not have commanded that respectful attention which KNIGHT invariably paid to his suggestions and criticisms.

At Elton Hall KNIGHT carried on simultaneously the multifarious activities of a general farmer, stock-breeder and fruit-grower, and found time also to raise new hybrids of several different kinds of fruits and vegetables. He was then becoming interested in what he described as the "phenomena observable during the conversion of a seed into a plant."

"Having a strong rill of water passing through my garden, I constructed a small wheel similar to those used for grinding corn, adapting another wheel to a different construction, and formed of very slender pieces of wood, to the same axis." KNIGHT'S wheel has long since rotted away, but a drawing of it still remains, and the part played by this early klinostat in establishing the law of geotropism will not soon be forgotten by physiologists.

It is not easy to determine where KNIGHT'S actual farming took place during these years. In 1804 he writes to BANKS from "my farm near Hereford," and this may have been Tillington, about four miles from Hereford, where he certainly had a nursery at one time. Wherever it was, his Merino-Ryeland cross-bred sheep seem to have prospered, for in June 1805 they won all the prizes at the Hereford Agricultural Meeting. In these years he was breeding new cider apple varieties by crossing the Siberian Crab with local cider varieties with the object of inducing hardiness. In the same way he attempted to combine hardiness with earliness in new varieties of grapes, and found time to design a new type of forcing-house for grapes, and for strawberries, and to experiment with new ways of growing melons.

A letter written to BANKS on August 8, 1805, gives a fair picture of KNIGHT'S normal activities at that time. He starts with a word about his water-wheel, gives his views on the connexion between Berberis and Rust on wheat, and passes on to discuss Mildew on peas in relation to moisture conditions. Next comes a passage on the hardy constitution of his Merino-Ryeland cross-bred sheep in comparison with the "pampered South Downs we saw at Mr. Cokes." He then describes a pruning experiment on young apple trees, gives an account of his breeding work on early grapes, mentions an improved method of haymaking, and ends up with an account of his latest experiments on the cultivation of the potato.

In this year KNIGHT was elected a Fellow of the Royal Society, and in 1806 was awarded the Copley Medal for his papers on vegetable physiology.

Many years afterwards, KNIGHT'S eldest daughter, FRANCES

STACKHOUSE ACTON, wrote in her memoirs: "It must have been in the autumn of 1806 that we were told that the young philosopher, Mr. HUMPHRY DAVY, who had distinguished himself by some discoveries in chemistry, was coming to Elton, and we looked forward to his arrival with considerable awe; but to our surprise, came a shy young man who blushed and held his head down when he was spoken to, and who was very soon running races with us on the lawn." For the last three years DAVY had been lecturing at the Royal Institution on the Chemistry of Agriculture as well as giving other chemical lectures and working on voltaic electricity. In connexion with his research in agricultural chemistry he had been allotted a piece of ground at Roehampton for experimental purposes, and the DUKE OF BEDFORD carried out trials for him at Woburn. This brought him into touch with most of the leading agriculturists of the day, but it seems probable that what first brought him to Elton was the desire to learn from KNIGHT something of his views on "vegetable Physiology." In later years he wrote: "In considering the physiology of the subject I shall have little to do but to record your labours, for you have created almost all the science we possess on that interesting subject." KNIGHT, on his side, must have felt strangely drawn towards this shy young man whose ardour for experiment was even greater than his own, and in spite of the difference in their characters the two became great friends.

Some two years after this, KNIGHT's elder brother, PAYNE, decided that he could no longer endure the responsibilities of keeping up Downton Castle, the "stone mansion in castellated style" which he had built for himself on the north bank of the Teme, near Ludlow. PAYNE KNIGHT was a bachelor, a scholar, a poet and a patron of the arts. He had a passion for collecting, and spent a fortune on bronzes, coins and gems, which he bequeathed, at his death, to the British Museum.

ANDREW KNIGHT and his family went to live at Downton Castle (fig. 85) early in 1808, while PAYNE had a cottage fitted up for himself in the grounds. ANDREW took over the management of the whole of the estate, 10,000 acres, and here for the next thirty years he lived and worked: a landowner who was his own agent, a farmer and stock-breeder actively engaged in the experimental breeding of cattle, sheep, horses, dogs and poultry; keenly interested in the social problems of his own countryside; but above all a horticulturist with a detailed research programme in plant-breeding, pomology and plant physiology. He seems to have experimented with everything, from the potato to the Persian melon and the pineapple, and in all his experiments he recorded facts and figures either in his memory, which was proverbial for its retentive powers, or in note-books and memoranda which he must have written in his own hand.

One of his daughters certainly helped him with occasional illustrations, and later in life his head gardener seems to have been entrusted with a good deal of the practical fruit work, but the planning, the

recording and the interpretation of the results of the experiments were always the work of KNIGHT himself.*

For twenty-seven years, from 1811 to his death in 1838, he was President of the Horticultural Society of London. In the Transactions of the R.H.S. are to be found the main bulk of his experimental findings of a pomological nature, whilst his researches on plant physiology were communicated mainly to the Royal Society in the form of papers.

For over fifty years this friend of BANKS and DAVY lived in the depths of the country. While all Europe echoed to the clash of arms or the tongues of the politicians, KNIGHT was making his observations on the origin and office of alburnum in trees, on the causes which influence the direction of the growth of roots, on a method of facilitating the emission of roots from layers, on the cultivation of the Guernsey Lily, on the supposed influence of the pollen in cross-breeding, on the propagation of trees by cuttings in summer, or merely on the culture of the shallot.

This country squire, when he took a walk with his gun and dog, was really observing the inherited instructive propensities of the "springing spaniel" at his heels, or the adaptation to its environment of the woodcock he was shooting.

At other times he would walk through orchards planted by himself with varieties of his own raising to inspect the habits of his own "grey" type of Hereford cattle, or of his own Merino-Ryeland cross-bred sheep, to attend the weekly meeting of the board of guardians at Ludlow.

In 1827 his only son was killed in a shooting accident, and the blow proved a terrible shock to KNIGHT, then in his sixty-eighth year. He threw himself with renewed energy into his experiments, and for eleven more years he continued to live at Downton. Medals came to him from learned societies all over the world, and he went on contributing papers to the Royal Society and to the Horticultural Society up to the year of his death. In May 1838 he travelled to London by coach on his yearly journey to attend the General Meeting of the Horticultural Society. He had suffered from dyspepsia during the last few years, and the journey appears to have been too much for his strength, for he was taken seriously ill on his arrival in London and died there on May 11.

A fortnight later, GEORGE BENTHAM, then Secretary of the Horticultural Society, wrote in his diary: "to the Garden Exhibition, there were about 3,000 present, many of the highest classes. The exhibition the finest we have ever had in greenhouse and stove plants." Meanwhile, THOMAS ANDREW KNIGHT, who had been President for twenty-seven years, was buried in the quiet churchyard of his native village of Wormsley, on May 22, 1838.

No serious attempt seems to have been made to assess the true

* The complete disappearance since his death of all trace of his own private notes and horticultural records forms one of the many unsolved mysteries in the life of ANDREW KNIGHT.

value of KNIGHT'S total contributions to physiology, genetics, and pomology in the light of present-day knowledge.

His work on the ascent and descent of the sap in plants, the nature of cambium, the phototropism of tendrils and the geotropism of roots and stems, has been so long embedded in the text-books of plant physiology that it would seem almost superfluous for a modern student to acknowledge the source of such apparent truisms.

As a geneticist KNIGHT has been criticized for having failed to recognize the true "Mendelian" significance of his own experiments in the breeding of peas, and for his explanation of the initiation of variations in cultivated plants when they were brought in from the wild. On the other hand, his empirical work as a practical breeder of new hybrids in all the most important fruits and vegetables must have done more to raise the standard of excellence of these crops than any single contribution in this country before or since.

In the domain of practical horticulture the originality and range of his investigations are positively staggering: vegetative propagation, rootstocks, grafting of all kinds, including stub-grafting, pruning, ringing, training of wall trees, incompatibility between stock and scion, manuring, humus, budding and grafting of walnuts, climatic conditions, frost damage, the life history and control by spraying of insect pests and fungus diseases were all subjects of his investigations on hardy fruits. He did work on the cultivation of the melon, mango, fig, mulberry, pineapple and grape under glass, and designed a hothouse with a curvilinear iron roof which is still standing in the grounds of Downton Castle (fig. 86). His experiments with vegetables, apart from breeding new and improved varieties of peas and Brassicae, were largely concerned with new methods of cultivating for increased earliness. These experiments were frequently devised to elucidate some problem of the physiology of the stem, leaf or root, especially in the case of the potato.

KNIGHT'S memory is still cherished in the Royal Horticultural Society by the Knightian Medals which are distributed for excellence in the arts which he adorned, and if his memory still lives it is due more to this than to the efforts of any of the other learned societies who hastened to do him honour in his lifetime.

The author tenders his grateful thanks to Mr. C. ROUSE BOUGHTON KNIGHT and to Mrs. E. BROMLEY MARTIN, direct descendants of THOMAS ANDREW KNIGHT, without whose kind help and guidance this article could never have been written. Nor could the search for many of the places mentioned have been brought to a successful conclusion without the enthusiastic collaboration of Mr. JOHN ARKWRIGHT and Mr. LINDSAY MACKIE.



FIG. 81.—MRS. T. A. KNIGHT.
From a portrait in Downton Castle.

[*To face p.* 324.



FIG. 82.—ELTON HALL, NEAR LUDLOW.
T. A. Knight lived at Elton Hall from 1791 to 1808.

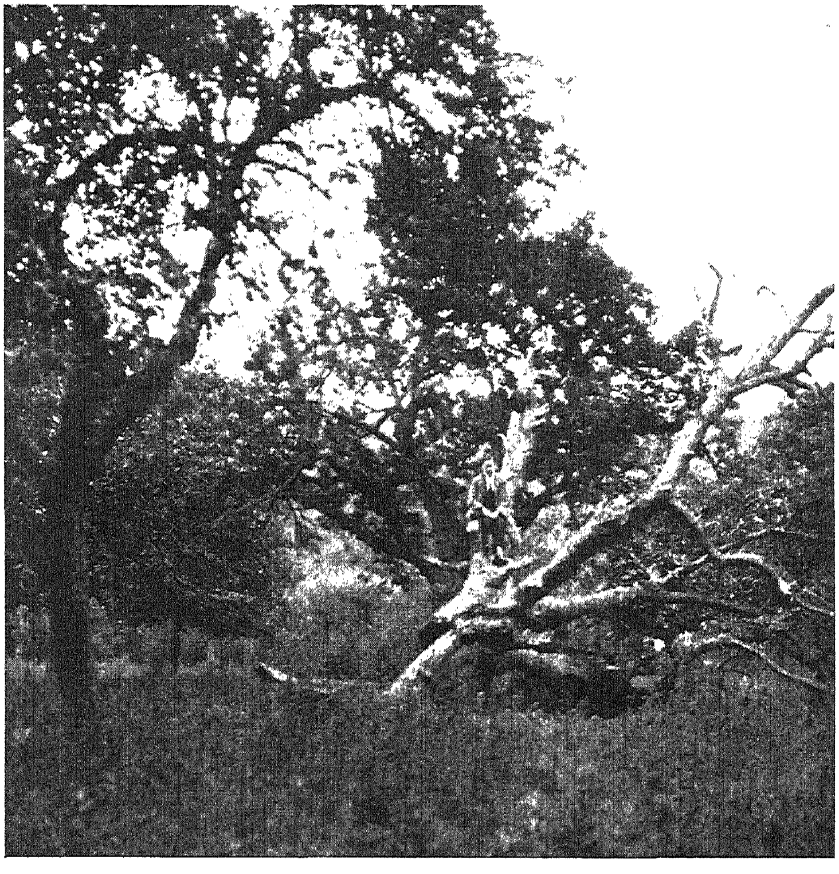


FIG. 83.—AN OLD CHERRY TREE IN KNIGHT'S ORCHARD AT ELTON.
Probably planted by T. A. Knight.
[Photographed 1931.]



FIG. 84.—PERRY PEAR TREES IN ORCHARD AT WORMSLEY GRANGE.

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MUSHROOMS.

By Miss D. M. CAYLEY.

[Read January 25, 1938; Dr. W. F. BEWLEY, C.B.E., in the Chair.]

I MUST begin by pointing out that my Mushroom investigations are still in the experimental stages and that what I am going to tell you to-day is, as yet, of little, if any, practical or commercial importance.

Mushroom growers at the present day know just about the last word, but I maintain not quite the last word, about the actual cultivation of Mushrooms for the market, and I am not going to poach on their preserves; they know much more about this side of the subject than I do. But there is still much to be learned about the Mushroom, the organism itself, and I have spent some years investigating several different species and varieties of both wild and cultivated Mushrooms and their reactions to different media and different conditions. Although three wild species of edible Mushrooms very closely resemble the white cultivated market varieties to the naked eye, when grown under the same controlled conditions they behave very differently and cannot all be classified (as they are at the present day) under the general heading of *Psalliota campestris*, or *Agaricus campestris*.

I will give a brief description of the life history of the Mushroom plant. The vegetative part of the Mushroom consists of very fine tubular structures called hyphae; these hyphae branch profusely and form the mycelium or spawn. The mycelium grows and spreads rapidly through and absorbs nutritive substances from the medium or compost. After a period, which varies according to external conditions and type of substratum, the mycelium passes into the next phase and the separate hyphae get massed together and coiled round one another to form thicker white strands, visible to the naked eye. The caps are formed on these strands, first as minute white masses of mycelium, and then during the rapid development of the cap the tissues become differentiated into stalk, gills, flesh, and veil. The veil ruptures, the cap expands, and the gills are exposed to the air.

If a transverse section is cut across a gill it can be seen that the central column is composed of loosely interwoven hyphae surrounded by layers of more densely packed cells. These cells give rise to small bodies of varying lengths called basidia, closely packed together in regular rows all over the surface of the gill. These bodies produce the spores at the ends of minute stalks, and the spores are the seeds of the Mushroom. The basidia and spores are minute, are produced in vast numbers all over the surface of the gill, and when one basidium has discharged its spores it collapses and dies and another basidium grows up to take its place, and so on. This process goes on for from four to five days.

Now the number of gills in a normal-sized wild autumn field Mushroom is from 300 to 500, and Professor A. H. R. BULLER has estimated the total gill surface to be roughly 1·33 square foot in a normal-sized Mushroom, and the number of spores discharged within the region of 1,600,000,000 (sixteen hundred million). The spores are very light and are dispersed by wind, air currents and also to some extent by insects, slugs, etc. Thus, a vast number of spores are discharged and come to nothing, and only an occasional spore comes to rest on a spot offering the very special conditions necessary for germination and growth. I am now speaking only of the conditions in the open fields with regard to the wild species of Mushrooms; the necessary conditions for the cultivated varieties are well known. Since each individual cap of the wild Mushroom makes such a prodigious effort to reproduce itself and keep the species going, how is the poor clumsy scientist to find out what these very special conditions are? This can only be done step by step under strictly controlled conditions in the laboratory.

There is one definite microscopical morphological difference between the wild species and the cultivated varieties which, so far, has held good for all the forms I have had under investigation. I must just touch upon this point as it is of fundamental importance, and is the only mark, short of making elaborate experiments, by which the wild cap can be distinguished from a cultivated one with any degree of certainty.

In the cultivated varieties each basidium gives off two spores only (occasionally you find an abnormal basidium with three or even four spores), but the wild species have regularly four-spored basidia. This difference was first observed by ATKINSON in 1906, but very little attention was paid to this important observation until recent years. If you want to examine the gills of the Mushroom there is no necessity for the elaborate process of cutting sections. All you have to do is to pick out a small piece from a single gill with a pair of forceps when the gill is buff in colour, place it on a damp slide or thin piece of glass and put it under the low power of the microscope so that you look down on the surface of the gill. With the cultivated varieties the spores will be seen lying in pairs, with the wild in groups of four.

The number of spores on the basidium is definitely correlated with certain physiological differences, the chief being that the wild species with four-spored basidia will not grow on composted stable manure: at least, I have not succeeded in inducing them to do so.

I should just like to touch upon the different wild species I have been investigating.

First of all there are the three wild grass-land species.

1. The common autumn field Mushroom, the true *Psalliota campestris*. This species is found in grass on pastures, in meadows, hay fields, etc.; on rather heavy soils somewhat deficient in lime as in parts of Devonshire; on chalk downs as in Dorsetshire and Wiltshire; on limestome soils as in Lincolnshire; and even on lowlying pastures on the Solway

Firth which are inundated periodically with sea-water at very high tides. Thus the presence or absence of lime and the texture of the soil do not seem to be controlling factors for this species. But turf appears to be essential. Yet turf alone is not all-sufficient. There is some other factor present in the soil of fields in which this species occurs; it may be micro-organisms, it may be its physical condition, such as aeration, moisture content, etc.; it may be the presence of some mineral, but what it is is still a complete mystery. In fields in some localities the autumn field Mushroom forms what are known as fairy rings—more or less complete rings of darker green more luxuriant grass with Mushrooms growing on them. The grass derives some benefit from the presence of the spawn in the soil, and it is possible that the Mushroom derives some benefit from the grass, but so far I have not been able to prove this conclusively or to my satisfaction, but I give it to you for what it is worth.

2. The June field Mushroom is also a grass-land species, but not the same thing as the autumn Mushroom. This form or species is not so common as the autumn form. I have only come across it in Lincolnshire, where it was brought to my notice by Mrs. RAWNSLEY of Well Vale, near Alford, who very kindly allowed me to go over her fields to investigate it. I have been informed that it occurs in parts of Kent and is probably more common than I know, as one does not, as a rule, look for Mushrooms in June, and of course much depends on the rainfall in that month. This June form also forms fairy rings and is quite as excellent in flavour and consistency as the autumn Mushroom.

3. The larger grass-land species, commonly known as the horse Mushroom, is found in coarser grass as a rule, in pastures and in meadows and sometimes in grass on heaths. It is fairly easily distinguishable from the autumn field Mushroom on account of size and the fact that the gills do not colour up so fast and the cap does not deliquesce or melt away under moist conditions. This Mushroom also forms fairy rings; but in dry seasons the grass on the rings is poor or mostly dead owing to the excessive growth of the spawn in the soil. The spawn is so dense that rain—even a heavy thunderstorm—cannot penetrate and moisten the soil, and the grass is more or less killed out by drought. The horse Mushroom is also good to eat provided that the caps are gathered after they have expanded when the gills are pinkish or buff in colour. If picked in the button stage it is rather tough and indigestible.

4. The wild haystack Mushroom is found round hayricks of two years' standing or longer. It is no use looking for them round ricks of the current year; the Mushroom has not had time to develop. This is not a true grass-land species: although often found growing in coarse grass round haystacks, I have found it growing without grass. It is rather a large, long-stalked form and is good only when gathered in moist weather, as it dries out and becomes rather leathery. It is excellent in flavour and consistency.

5. There is another wild form which occurs on cultivated soil, also very like the white cultivated Mushroom, but if the stalk is split

open the internal tissues are stained a bright yellow and the cap stains yellow on bruising. This yellow staining form (*Psalliota xanthoderma*) is to be avoided. Some people can eat it with impunity, but others have an idiosyncrasy and it is somewhat poisonous to them though it does not kill.

Lastly, there is a brownish or white form which occurs sporadically on manure heaps, round cattle sheds in fields and on cultivated manured land. This form has two-spored basidia and may or may not be an escape from Mushroom beds. It can hardly be looked upon as a wild species as it is always associated with manure, but may possibly be the origin of the cultivated Mushroom, although I have never been able to get any definite information as to the origin of the cultivated Mushroom.

I started this Mushroom investigation with the object of getting some information of purely scientific interest—namely, why the wild forms had four-spored basidia and the cultivated two-spored, and how this difference affected the life history of the two forms. This appeared to be a fairly straightforward piece of work, but as is so often the case in research, the problem bristled with difficulties from the first, and while I was grappling with these difficulties I found myself following up a more hopeful side track, very different from what I started out to do.

In order to investigate the life history of a fungus it is essential to get single spore cultures, and although it proved quite easy to germinate the spores of the cultivated varieties, I could not, at first, germinate the spores of the wild grass-land species. Later however, by a happy accident, I discovered that if you want to germinate the spores of the wild autumn field Mushroom the spores must be taken from a fully expanded cap when the gills are umber in colour and full spore discharge is in progress. The horse Mushroom still defies me; I have not succeeded in germinating the spores.

The best solution for germinating Mushroom spores is Knop solution.

Even if the spores of some forms will not germinate there is no difficulty in obtaining pure tissue cultures of any form of Mushroom provided you have a few test-tubes and the facilities for sterilizing the medium on which to grow them. You just tear open the stalk of a healthy young cap, cut out a small portion of the internal tissue with a sterile knife or scalpel under aseptic conditions and place it on the surface of the medium in the tube. The culture will grow at room temperature, but it is better, if possible, to start it in an incubator at a temperature of 26°–27° C. (79°–81° F.). If an incubator is used the culture should not be left more than about fourteen days at this temperature, and then taken out and kept under rather cooler conditions.

A good medium for growing cultures of Mushrooms is Quaker oats agar, cheap and easy to make.

Having got cultures of the forms I wanted to investigate, the first most obvious thing to do was to grow them on well-composted stable manure. I did not grow proper spawn for this purpose but just

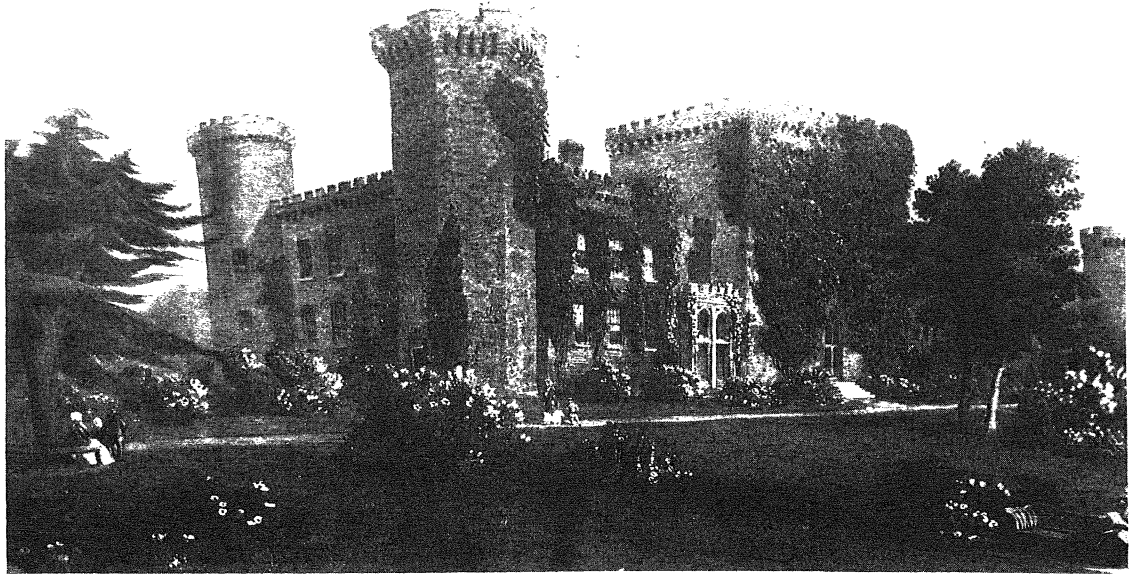


FIG. 85.—DOWNTON CASTLE.
From an old water-colour painting.

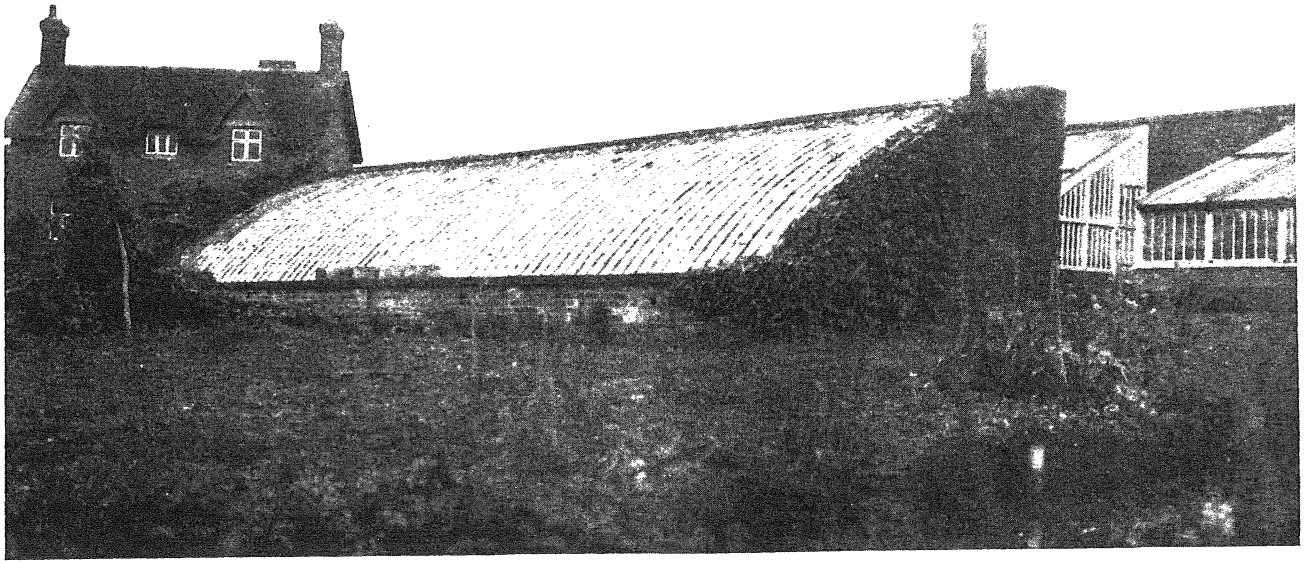


FIG. 86.—THE OLD GREENHOUSE AT DOWNTON WITH AN IRON-FRAMED CURVILINEAR ROOF.

[*To face p.* 329.

planted oat agar cultures from test-tubes. To my surprise, after about two months the beds spawned with the cultivated varieties produced their first flush and continued to crop for some months; but the wild species failed to show any growth throughout the six months during which the experiment was kept going. Three separate cultivated varieties and the three wild species—the autumn field, the haystack and the horse Mushrooms—were tested.

The next step was to find some medium or compost on which the wild species would grow. A number of investigators in America and France, and a few in this country, have devised various artificial composts consisting of plant residues, straw and other ingredients, both for manure and Mushroom culture, with varying degrees of success. The majority of these composts contained a certain proportion of stable manure, and most of them proved to be less satisfactory than stable manure for the cultivation of Mushrooms. WAKSMAN and RENEGER in the States claim to have obtained a crop of Mushrooms equal to that on stable manure on a purely artificial compost consisting of 70 per cent. straw and 30 per cent. tobacco plant residue with the addition of five parts ammonium phosphate to 100 parts compost.

As far as I know none of these investigators has attempted to grow the wild species.

As stable manure is almost exclusively used by the trade and private growers, and seeing that the wild species I was dealing with grow in grass and in rotting hay round haystacks, I started making artificial composts the ingredients of which were based on the food of horses, namely hay, grass, and crushed oats, together with a liberal supply of straw. I even tested the effect of a little sugar, but found that it made no difference whatsoever. I made many preliminary trials, first with long straw and long hay in equal quantity, thoroughly mixed and moistened, stacked in a heap and allowed to ferment. The compost was turned at intervals as for stable manure. At the second turning the compost was watered with a solution of 2 ounces sulphate of ammonia to one gallon of water, and restacked. At the third turning, about seven to ten days later, slaked lime was mixed in. The temperature rose quite satisfactorily after each turning, and the permanent bed was made up at the fourth turning and allowed to settle. It should not be pressed down at first.

When the temperature had dropped to 70°–75° F., separate beds were spawned each with a separate form, one with a white cultivated variety, and three with the different wild species, the autumn field, the horse and the haystack Mushrooms. In these experiments the cultivated variety was used only as control, in order to ascertain if the compost contained the necessary ingredients for Mushroom growth. This compost, in bulk, proved unsatisfactory and produced only a few but quite normal caps of the cultivated variety. But when used in smaller bulk, in boxes about 2 feet × 15 inches, the cultivated variety grew fairly well and produced a crop. But again the three wild species failed to make any growth.

A second compost containing equal quantities of long straw, long hay, chopped straw and chopped hay was prepared with the object of improving the consistency of the final product by the admixture of chopped material. This was fermented and composted in much the same way and gave practically the same result. In bulk it was unsatisfactory, in boxes the cultivated variety produced a crop, but the wild species refused to grow. This compost was certainly of better consistency than the first, but it was obvious that the wild species did not like straw and hay fermented at a high temperature any more than they liked fermented stable manure.

A third mixture was then tried consisting of chopped material only. Being a denser mixture the temperature rose considerably higher and much more rapidly, so that the compost had to be turned at shorter intervals. The mixture was composted for fourteen days only before being placed in the permanent bed. Two wild species, the autumn field and the haystack Mushrooms, and one cultivated variety were tested on this compost with the same result; the wild species would not grow in the beds. But, over and above the beds, the compost was sterilized in large glass tubes and battery jars. This was done on the fourteenth day, and consequently all further fermentation was arrested. The great advantage of using glass containers is that the growth of the mycelium can be kept under observation. Again the wild autumn field Mushroom failed to grow, the cultivated variety grew well and fructified, and the spawn of the haystack Mushroom grew for the first time on a compost subjected to high temperature fermentation of short duration, that is, fourteen days. Thus the haystack Mushroom showed itself to be intermediate between the wild grass-land forms and the cultivated varieties as to its reaction to fermentation.

Experiments were then started with artificial composts fermented for different lengths of time. Instead of being fermented in bulk, 1 lb. chopped straw and 1 lb. chopped hay were mixed, moistened with a solution of 2 oz. sulphate of ammonia to one gallon of water and packed in a large biscuit tin. The compost was turned out of the tin after about ten days and ½ oz. of slaked lime mixed in and replaced in the tin. In such small bulk the temperature, of course, did not rise so high and attained a maximum of only 90° F., as compared with a temperature of 165° F. when composted in bulk. Portions of the mixture were taken out at intervals of one month, six weeks and two months, sterilized in tubes and battery jars and inoculated with the various cultures. The cultivated varieties grew well in all the tests up to two months low temperature fermentation, the wild autumn field Mushroom failed to grow in any, but the haystack Mushroom tolerated one month low temperature fermentation and fructified, again showing it to be an intermediate form.

Since it was evident that the wild grass-land species would not tolerate the by-products of high or low temperature fermentation and that the wild haystack Mushroom would grow only on a compost

fermented at a high temperature for a short period or rather longer at a low temperature, a further series of tests was started with chopped straw and hay naturally rotted for some weeks in the open, moistened with the same solution of sulphate of ammonia, spread out in thin layers on a concrete surface and not allowed to generate any heat. It is quite possible that, even if not allowed to heat, some form of fermentation does take place in damp plant residues; but in this case very little disintegration of the ingredients had occurred before spawning. Half this compost was treated with lime and half left without.

Some of this compost was tested in large 12-inch pots, and some was sterilized after about three to four weeks rotting in glass containers. The cultivated varieties grew well and fructified in the pots, and the spawn grew well in the sterilized glass containers. The wild species did not grow in the pots, but spawn of all the wild species grew fairly well in the sterilized compost, showing that once the medium had been sterilized and further rotting arrested, this medium was fairly satisfactory, more especially for the wild haystack Mushroom, which produced several successive flushes in the battery jars.

Unfermented artificial composts were then tried, consisting of chopped straw, chopped hay, sand, with or without oats, mixed, moistened and sterilized without being subjected to any previous fermentation or rotting. In some cases both crushed oats and nutrient solution were added, in others the crushed oats were omitted. These various unfermented mixtures were mainly tested in glass containers and kept under strictly controlled aseptic conditions. It was found that the spawn of all forms of Mushrooms, both wild and cultivated, grew vigorously on these freshly sterilized composts, so that it was now possible to grow spawn of the wild grass-land and haystack Mushrooms. The mixture to which crushed oats and nutrient solution were added has been adopted as a standard spawn-growing compost, and was used for the production of spawn.

It is quite difficult enough, I can assure you, to get positive results in sterilized glass containers, under strictly controlled conditions. But now the question was what would happen under less controlled ordinary cultural conditions, where many other factors come into play, such as competition of micro-organisms, variations in temperature, atmospheric moisture and so on. In order to test these results a comprehensive series of trials was set up in large 12-inch pots and a few medium-sized boxes. A further ingredient was added to some of the composts, namely dried lawn-mowings. The mowings were spread out in thin layers in a shed as soon as cut and allowed to dry without the generation of heat, turned several times till thoroughly dry and then stored in sacks until required.

Twenty-four different mixtures were tried :—

Fermented chopped straw and chopped hay, with and without lime, with and without soil.

Fermented chopped straw and dried lawn-mowings, etc.

Fermented chopped hay and dried lawn-mowings, etc., and the same mixtures made with naturally rotted material.

Fermented chopped hay and dried lawn-mowings are not to be recommended, as the resulting product is a sticky, lumpy, highly alkaline mass totally unsuited, as far as physical conditions go, for the growth of the Mushroom. Fermented straw and dried lawn-mowings are not much better.

Dried lawn-mowings, however, can be used in the naturally rotted mixtures.

Four pots of each of the twenty-four composts were set up and each pot spawned with a single form of Mushroom, one with a cultivated variety as control, and the other three with the autumn field, the haystack, and the grass-land horse Mushrooms respectively, making ninety-six pots in all.

Large pots had to be used owing to lack of space and adequate accommodation. It was impossible to have ninety-six different beds and there was not even room in the greenhouses for the pots, so they had to be packed closely together in a wooden shed and covered with blanketing during the winter months, and an oil stove kept burning day and night to keep out the frost. The temperature varied from 33° to 54° F., conditions far from ideal for Mushroom cultivation !

In spite of being subjected to such a severe test the cultivated varieties fructified on nineteen out of the twenty-four different composts both fermented and naturally rotted, showing that the composts contained the necessary ingredients for Mushroom growth. But again the wild grass-land species made no growth in the pots and the haystack Mushroom fructified on only one or two of the naturally rotted composts.

On naturally rotted mixtures, sterilized to arrest all fermentation or rotting by other living micro-organisms, the haystack Mushroom flourished and gave successive flushes on a small amount of compost in battery jars, and even the two grass-land species grew well at first and the spawn permeated the compost, but eventually died out without fructifying, even when sterile grass seedlings were grown in the jars.

The addition of soil to the naturally rotted composts greatly affects the type of growth of the mycelium of all forms of Mushrooms. The spawn tends to become stringy much more rapidly with soil than without, and hence such composts are not suitable for spawn growing. My standard spawn-growing compost, you will remember, contains chopped straw, chopped hay, crushed oats, sand and a nutrient solution but no soil, is a loose open compost, and in this mixture the mycelium remains in the diffuse filamentous stage for a prolonged period.

The effect of omitting lime from the artificial composts containing soil, both fermented and naturally rotted, is to induce a tendency to the production of a considerable number of incipient fruiting bodies which never come to maturity, and much of the vigour of the spawn is wasted by clumping and the production of many small caps, as against fewer larger caps.

In conclusion, I must thank you for having listened so patiently to a tale of a long series of failures—negative results the scientists call them, it sounds better—with regard to the wild grass-land species. I had hoped that, after I had succeeded in finding out how to germinate the spores and how to grow the spawn of the wild autumn field Mushroom, I should be able to devise some method of bringing this elusive but very excellent species under cultivation; but I have to confess that I have failed to do so.

On the other hand, I have met with better success with the wild haystack Mushroom—positive results this time. I think that in time, and after further experiment, it may be possible to bring this excellent wild form under cultivation. The spores germinate freely, the cultures grow rapidly on a simple cheap mixture of naturally rotted material and will fructify on it with the addition of from half to one-third the volume of soil. When you compare the cost of producing this Mushroom with the present-day practice of growing Mushrooms on composted stable manure, the labour entailed in preparing the artificial compost for the haystack Mushroom is negligible as compared with the elaborate process of composting stable manure. Also, the artificial compost is very much cheaper and the ingredients easily obtainable in this country, a thing which cannot be said of stable manure at the present time. But the haystack Mushroom has three disadvantages; as it will not tolerate fermentation accompanied by the generation of heat it has to be grown on a cool medium, and artificial heat would be necessary. I gather, however, that a number of growers have installed artificial heating in their Mushroom houses. Secondly, the caps of this form, although large, are not tough and would not travel very well. But doubtless the packers would be up to dealing with this difficulty should it arise. Thirdly, unless the caps develop in a moist atmosphere the colour changes from pure white to pale buff and they are hardly recognizable for the same species, and the public might get frightened and think they were being asked to buy toadstools.

As regards artificial composts consisting of varying proportions of straw, hay and lawn-mowings for the cultivated Mushroom, you have seen they will grow on fermented composts and do best when lime and soil are added. But there is much more work to be done before an ideal mixture is produced anything like comparable with stable manure. Again, I think this will be possible, but I must emphasize that the results I have given you are only preliminary attempts made under inadequate cultural conditions, and that my main object was not to find a suitable artificial compost for the cultivation of the market varieties of Mushrooms but to test the effects of fermentation or no fermentation on the growth of the wild forms.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Androsace Watkinsii. A.M. April 26, 1938. From Viscountess Byng of Vimy, Thorpe-le-Soken. A smaller and more compact form than *A. sarmentosa* with tighter rosettes. This variety has deep pink blooms on typical 4- to 5-inch hairy stems.

Arisaema sikokianum. A.M. May 24, 1938. From Messrs. Perry, Enfield. This uncommon Japanese Aroid is a plant of very striking appearance. The large spathe of the inflorescence consists of a lower, tubular portion and an erect, undulate blade, dark brownish-purple externally and striped with brown and white inside. The ternate leaves have oblong, unevenly serrate leaflets about 2½ inches long.

Boykinia Jamesii. A.M. May 3, 1938. From Mrs. Dyson Perrins, Davenham, Malvern, Dr. Giuseppi, Felixstowe, and Miss D. C. Hopton, Bartestree. A handsome species having stiff 6- to 9-inch spikes of large carmine flowers, spatulate, with broad rounded tips and rounded bases. The rounded, serrate, long-stalked leaves are bright green and abundant.

Bulbophyllum Lobbii, Gatton Park var. A.M. May 24, 1938. Originally sent from Java by Thomas Lobb in 1846, this species bears solitary tawny-yellow flowers, the sepals and petals marked with longitudinal reddish lines. The present example seems to have flowers of larger size, and may represent the variety *siamense*. Sent by Sir Jeremiah Colman, Bt., Gatton Park, Surrey.

Canarina Eminii. A.M. May 24, 1938. From P. M. Synge, Esq., West Byfleet. A pretty plant from Uganda, suitable for the cool greenhouse. The weakly scandent growths bear deltoid, coarsely toothed, grey-green leaves and large, pendulous, bell-shaped flowers. The flower has a spreading, green calyx and buff-yellow, red-striped corolla. The tuberous roots may be lifted and dried off after flowering like those of a Dahlia.

Carnation 'Allwood's Cream.' A.M. May 24, 1938. A perpetual-flowering exhibition variety of robust growth and free-flowering habit with stiff stems. Flowers 4 inches across, full centred, creamy-white ; petals slightly fringed, sweetly scented ; good calyx and stem. Raised and shown by Messrs. Allwood, Wivelsfield Nurseries, Haywards Heath, Sussex.

Carnation 'Puritan.' A.M. May 24, 1938, as a market variety. A perpetual-flowering variety of good habit, with freely produced flowers on stiff erect stems. Flowers 3½ inches diameter, centre somewhat full, clear white, faintly scented ; petals fringed ; calyx strong. Raised and shown by Messrs. Allwood.

Clianthus puniceus var. albus. A.M. May 10, 1938. From Lord Aberconway, Bodnant. A very handsome variety, differing from the type in having creamy-white flowers.

Cymbidium × 'Lucinda,' Cannizaro var. A.M. May 10, 1938. The tall spike bore four flowers of comparatively large size and with all the segments much broader than is usually seen in the genus. In colour, blush-white with pale pink shading, the labellum with crimson blotching on the margin of the front lobe and with a conspicuous yellow area in the centre. The result of crossing *C.* × 'Flamingo' with *C.* × 'Redshank.' Exhibited by E. Kenneth Wilson, Esq., Cannizaro, Wimbledon, S.W.

Daphne Cneorum eximia. A.M. April 26, 1938. From A. T. Johnson, Esq., Ro-Wen, Conway. A very floriferous and fragrant variety with ample heads of a deep rich pink.

Eritrichium nanum. A.M. May 24, 1938. From Frank Barker, Esq., Stevenage, Herts, who was also awarded a Certificate of Cultural Commendation for this exhibit. A widely distributed species, difficult in cultivation. The light green, spatulate, fleshy leaves are covered with silver, silky hairs, and grow in cushions from which spring short flower stalks bearing rounded, yellow-eyed flowers of a pure azure blue.

Fendlera rupicola. A.M. May 24, 1938. From Dame Alice Godman, D.B.E., Horsham. A small deciduous shrub from the Southern U.S.A. The branches are slender and bear small opposite and entire grey-green leaves and four-petalled white flowers 1½ inch across.

Homeria collina var. ochroleuca. A.M. May 24, 1938. From T. T. Barnard, Esq., Wareham. The flowers exhibited were cut from seedlings raised from collected plants, and showed much variation in colour from pale yellow (to which this name belongs and the **A.M.** applies) to apricot, with or without blotches of red or warm brown inside. The branched stems bear a succession of flowers and are useful for cutting. The orange form, var. *aurantiaca*, received the **A.M.** when shown by Mr. Collingwood Ingram in 1934.

Laeliocattleya × 'Kismet' var. 'The Spinney.' A.M. May 24, 1938. This differs from the majority of Laeliocattleyas in the comparatively flat flowers, the broad segments of which are deep rosy pink, the labellum mauve-purple with a yellow throat area. The result of crossing *C.* × 'Tityus' with *L.-c.* × 'General Maude.' Exhibited by F. E. Griggs, Esq., The Spinney, Chislehurst, Kent.

Laeliocattleya × 'Rome' var. 'Romulus.' A.M. May 24, 1938. The result of crossing *Cattleya* × 'Remy Chollet' with *Laeliocattleya* × 'James Goodier.' The spike bore three rose flowers, the outstanding character being the unusually large crimson-purple labellum. Exhibited by Messrs. Sanders, St. Albans.

Lewisia brachycalyx. A.M. May 3, 1938. From Mrs. W. D. Crewdson, Kendal, and Mrs. A. N. Griffith, Newnham, Cambridge. A species from North America with large, white, erect flowers on 1-inch stems, which spring from the centre of a rosette of dark green 3- to 4-inch elliptical fleshy leaves.

Mahonia lomariifolia. A.M. May 24, 1938. From Messrs. Charlton, Tunbridge Wells. A very handsome species of recent introduction,

native of Yunnan and Formosa. The young specimen exhibited had a single erect stem bearing many horizontally-spreading leaves, the largest being 18 inches long with 33 leaflets. The leaflets are dull green, 2½ inches long, elliptical, with three spiny teeth on each margin and a sharply pointed, decurved tip. If completely hardy, this promises to be a most valuable foliage shrub.

Menziesia ciliicalyx. A.M. May 3, 1938. From R. B. Cooke, Esq., Corbridge. A 10- to 12-inch shrub from Japan with small elliptic, dark green leaves tinged with mauve at the points. The large pink pendent bells, the tips of which are also shaded with mauve, are borne on delicate stalks from the tips of the shoots.

Miltonia × 'Limelight' var. 'Vesuvius.' A.M. May 24, 1938. The result of crossing *M.* × *Armstrongii* with *M.* × 'Lycaena.' The flowers are large, the sepals rose, the petals crimson, the wide labellum mainly crimson bordered with rose, and with a yellow crest area at the base. Exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Odontioda × 'Pauline' var. 'Crimson King.' A.M. May 24, 1938. This hybrid between *Odontioda* × *Leeana* and *Odontoglossum* × 'Miguelito' bore an arching spike of a dozen well-formed rich cherry-crimson flowers. Exhibited by Messrs. Stuart Low, Jarvis Brook, Sussex.

Odontoglossum × 'Brimstone Butterfly' var. 'Golden Glow.' A.M. May 24, 1938. A charming hybrid of uniform bright golden-yellow, the labellum bearing an occasional red spot. The result of crossing *O.* × *Armstrongii* var. 'Aureole' with *O. crispum*. Exhibited by Messrs. Armstrong & Brown.

Odontoglossum × 'Brito-Martis' var. platycheilon. A.M. May 24, 1938. An elegant hybrid produced by crossing *O.* × 'Britannia' with *O.* × 'Purple Emperor.' The spike bore a dozen large flowers, heavily blotched with purple, the labellum very wide, reddish-purple with a white border, and bearing a yellow crest. Exhibited by Messrs. Charlesworth, Haywards Heath.

Olearia Gunniana 'Exbury White.' A.M. May 10, 1938. From Lionel de Rothschild, Esq., Exbury, Southampton. The flowers of this choice seedling are of greater purity than those of the common white-flowered type, and are very freely borne.

Ourisia macrophylla. A.M. May 10, 1938. From Lionel de Rothschild, Esq. A very fine perennial herb from New Zealand. The stalked, radical leaves are ovate with crenate margins, dark shining green and of leathery texture. The flowers are unequally five-petalled, white with yellow eye, nearly 1½ inch across, and are carried in whorls on an erect leafy stem about 18 inches high.

Primula hyacinthina. A.M. May 3, 1938. From R. B. Cooke, Esq. An umbellate species from Tibet, similar in size and habit to *P. muscarioides*, but differing in having farina on the under surface of the leaf. The powder-blue blooms, which are dark in the centre and light at the extremities of the petals, are borne on 10- to 12-inch stems and are strongly scented when they first open.

Primula Sieboldii alba. A.M. April 26, 1938. From Messrs. F. G. Mackenzie, Ilkley. A pure white variety with large fringed umbellate blooms growing on 6- to 10-inch bare stems. The ovate leaves are scalloped and stalked. Said to be perfectly hardy.

Ranunculus graminifolius. A.M. May 3, 1938. From Mrs. Winterbotham, Beaconsfield. A very handsome species, with lanceolate, glaucous foliage and large and plentiful flowers of a clear citron-yellow on long stalks.

Rhododendron chlorops. A.M. May 24, 1938. Collected by Forrest under number F. 16463, and raised and shown by the Earl of Stair, Lochinch Castle, Stranraer, Wigtownshire, as a hardy shrub for general garden use. Flowers widely campanulate, finally almost rotate, pale primrose to nearly white with a deep crimson splash on the lower part of the corolla tube within, the six lobes ½ inch long, the tube ¾–1 inch long; trusses eight- or nine-flowered. The elliptic-oblong, obtuse, mucronate leaves, up to 5 inches long by 1¾ inch wide, are dark shiny green and convex above, pale green, reticulate, concave below, glabrous on both sides.

Rhododendron × 'Dorinthia.' F.C.C. May 3, 1938. *Rhododendron Griersonianum* × *R.* × 'Hiraethlyn,' shown by Lord Aberconway, Bodnant, N. Wales, as a hardy plant for general garden use. Trusses loose, of six to nine flowers, each up to 3 inches across by 2 inches deep; clear shiny red with deep wavy lobes, borne on villous-glandular pedicels up to 1½ inch long. The oblong-obovate leaves, up to 5½ inches long by 1½ inch broad, are dark green and glabrous above, with felty fawn tomentum beneath.

Rhododendron × 'Fusilier.' A.M. May 24, 1938. A first cross between *Rhododendron Elliottii* and *R. Griersonianum*, raised and shown by Lionel de Rothschild, Esq., Exbury House, Southampton, which inclines towards *R. Griersonianum* in the form of its truss and its tomentose leaves, and to *R. Elliottii* in the shape of the leaves and the colour of its flowers, these being a shade paler than the red form of *R. Elliottii*, with a slight orange tinge. A hardy shrub.

Rhododendron × 'Phidias.' A.M. May 3, 1938. Shown by Lord Aberconway, as a hardy plant. *R.* × 'Astarte' × *R.* 'F. C. Puddle.' Flowers clear rich red, deeply funnel-shaped, about 2¾ inches wide by rather more through, calyx the same colour as the corolla, lobes irregular, about $\frac{3}{10}$ inch long, leaves oblong-elliptic, dark green, about 3½ inches long by 1¼ inch wide. Up to seventeen flowers in a truss.

Rhododendron × 'Kewdee' var. 'White Lady.' A.M. May 3, 1938. Shown by Admiral Walker-Heneage-Vivian, Clyne Castle, Swansea, as a flowering shrub for a sheltered position. *R. decorum* × *R.* × *kewense*. Large rather loose trusses of up to nine wide-open pure white flowers with a tinge of green or pale crimson within the base of the corolla tube; the corolla deeply lobed, up to 5 inches across by 2 inches deep; pedicels green, glandular. Leaves elliptic-ovate, obtuse, glabrous.

Rhododendron × 'Naomi' var. 'Nautilus.' A.M. May 3, 1938. Shown by Lionel de Rothschild, Esq., Exbury House, Southampton,

as a hardy plant for the woodland garden. *R.* × 'Aurora' × *R. Fortunei*. The round trusses contain about eleven widely funnel-shaped flowers up to 4 inches wide by 2 inches deep, rose flushed pale orange-yellow on the tube within and without, becoming paler with age. The glabrous, obovate, obtuse leaves are up to 5½ inches long by 2½ inches broad. This variety differs from the type, which received the **A.M.** in 1933, in its smaller and deeper-coloured flowers.

Scilla peruviana. **A.M.** May 24, 1938. From F. C. Stern, Esq., Goring-by-Sea. A species from the Mediterranean region (not from Peru, as the specific name suggests), quite hardy and suitable for a sunny border. It has a rosette of broad leaves 6 to 12 inches long and a short robust scape bearing a large conical raceme of blue-purple flowers. It was figured at t. 749 of the Botanical Magazine in 1804.

Symplocos paniculata. **A.M.** May 24, 1938. From Dame Alice Godman, D.B.E., Horsham. An ornamental shrub or small tree native of China and Japan. The small, white, fragrant flowers are carried in panicles 2 to 3 inches long, terminal and axillary on short lateral branchlets, and are followed by attractive blue fruits in autumn. The leaves are elliptical or obovate, 1 to 3 inches long.

Telopea truncata. **F.C.C.** May 24, 1938. From Lionel de Rothschild, Esq., Exbury, Southampton. *Telopea truncata* received the **A.M.** on May 29, 1934, and is described in the JOURNAL, R.H.S., **59**, p. 405.

Vanda tricolor var. planilabris. **A.M.** May 24, 1938. This differs from the type in having the front lobe of the labellum less convex with the ridges almost obsolete. The semi-pendulous spike bore eight flowers, fragrant, whitish, spotted with red-brown, the labellum bright magenta-purple. The species was introduced by Messrs. Veitch from Java in 1846, and the present plant was procured from this firm 42 years ago, and has been cultivated in the collection of Sir Jeremiah Colman, Bt., ever since.

Viola aetolica saxatilis. **A.M.** May 3, 1938. From G. P. Baker, Esq., Sevenoaks. A variety from Greece, which grows in a low loose mass of rich green foliage, with numerous golden-yellow flowers on 2-inch upstanding stems.

Vuylstekeara × **'Rosalie' var. 'Sunset.'** **A.M.** May 24, 1938. A decorative hybrid resulting from the crossing of *Odontioda* × 'Lorna' with *Odontonia* × 'Duchess of York.' The spike bore nine flowers, the sepals and petals soft cerise, the labellum golden-yellow with light brown shading. Exhibited by Messrs. McBean, Cooksbridge, Sussex.

SIDALCEAS AT WISLEY.

THERE is little to be found regarding Sidalceas in books on gardening, and nothing in the more popular books, before the beginning of the present century; even ROBINSON'S English Flower Garden does not mention them until much later. It is true that one, then called *Sida malvaeflora*, was figured in 1827 in the Botanical Register (t. 1036) from a plant in the Society's Garden at Chiswick, introduced from Columbia by DAVID DOUGLAS, and *Sidalcea candida* was introduced from Colorado in 1882, but they were grown in the gardens of the few. In 1890 the Rev. C. WOLLEY-DOD gave *S. oregana* (which is a variety of *S. malvaeflora*) and *S. candida* in a long "list of the best hardy plants for mixed borders" in our JOURNAL, **12**, p. 459, and both *S. malvaeflora* and *S. candida* also appear in select lists of hardy flowers in JOURNAL R.H.S., **13**, pp. 331 and 332.

Not until 1896 was an award made to a Sidalcea, when Mr. A. LISTER of Rothesay showed a "soft pink" variety of the lilac *S. malvaeflora* which received the **A.M.** At least two other varieties of this species were in cultivation by about this date: 'James Dickson' (a dark rose) and *atropurpurea* (light purple). It will be noted that *Listeri* is the name of a garden variety, not of a species.

Sidalcea is a genus of seven or eight species of herbaceous perennials found in western N. America, in Colorado, Oregon, Washington and British Columbia. They are plants for the sunny border, needing only ordinary good moist garden soil, and the numerous varieties which have now been raised can be propagated by division. Seedlings may be raised, which, however, will be likely to differ from the parent.

The season of flowering (about August), the silky texture of the flowers and the considerable range of colours now available make these plants desirable additions to the herbaceous border, and not only have the efforts of hybridists since the beginning of this century increased the range of colour and habit, but also the length of season over which flowers are produced, as will be evident from the notes made during the trial at Wisley of the varieties now available.

As they have gained such favour in the garden a trial of those available was arranged for judging in 1936. One hundred and eighteen stocks were sent for trial and planted in groups of three of each stock.

Flowering of some began in June, others in July, and yet others in August, and in the following notes, Early, Mid and Late refer to this variation in flowering time.

The varieties are arranged in the following notes under colour, and under each colour according to the type of flower and inflorescence, viz.

1. The Grandiflora type has large flowers closely arranged in medium-sized compact spikes, and the plant itself is usually more compact than in the other types.

2. The Stellata type with flowers starry in shape and rather loosely arranged on spikes which are more freely branched than in the Grandiflora type.

3. The Multiflora type with the smallest flowers bunched towards the tops of the blunt-ended spikes, the branching of the inflorescence being mainly towards the tops of the stems.

The following notes show the characteristics of the varieties and the Awards made.

FLOWERS WHITE.

Stellata type.

CANDIDA (Forbes, Perry, Wells, Ruys).—4 feet. Flowers 1½ inch diameter, white. Early.

FLOWERS BLUSH-PINK.

Grandiflora type.

SILVER QUEEN (Stark).—3 feet. Flowers 1⅜ inch diameter, blush-pink. Midseason.

Stellata type.

Elsie Heugh (sent by Mr. W. Wells, jun., Merstham, Surrey). **A.M.** July 16, 1936.—3½ feet. Plant compact; flowers 1¾ inch diameter, light blush-pink; petals fringed. Midseason.

Listeri (sent by Mr. Amos Perry, Enfield, Middlesex). **H.C.** July 16, 1936.—3½ feet. Plant rather spreading; flowers 1½ inch diameter, blush-pink almost white; petals deeply cut. Early to midseason. Distinct from the variety sent under this name by other senders.

MRS. S. R. MESSEL (Hemsley).—3½ feet. Flowers 1½ inch diameter, pale blush-pink. Midseason.

ORNATA (Hayward).—5 feet; of spreading habit; flowers 1¼ inch diameter, blush-pink. Early. (*candida* × *missouriensis*.)

JOHN FRASER (Hemsley).—4 feet. Flowers 1½ inch diameter, blush-pink. Midseason.

FLOWERS PINK.

Stellata type.

Silver Spray (raised and sent by Messrs. Stark, Fakenham, Norfolk). **H.C.** August 14, 1936.—5 feet. Plant of compact and graceful habit; flowers 1⅜ inch diameter, light clear silvery-pink. Late.

Gertrude West (raised and sent by Messrs. Hemsley, Crawley, Sussex). **A.M.** August 14, 1936.—5½ feet. Plant compact; flowers 1¼ inch diameter, pale pink. Late.

Loveliness (raised and sent by Messrs. Jones, Bromborough, Cheshire). **H.C.** August 14, 1936.—4 feet. Plant very compact; flowers 1¼ inch diameter; pale pink. Late.

FLOWERS ROSE-PINK.

Grandiflora type.

H. H. Cowley (raised and sent by Messrs. Hemsley, Crawley, Sussex). **A.M.** July 16, 1936.—4½ feet. Plant compact; flowers 2 inches diameter, bright rose-pink. Early midseason.

JUNE BEAUTY (Jones).—3 feet. Compact; flowers 1⅜ inch diameter, rose-pink; petals cut. Early midseason.

Multiflora type.

SUSSEX BEAUTY (Wells).—3½ feet. Flowers 1 inch diameter, light rose-pink. Early midseason. Distinct from other stocks sent under this name.

MRS. STANLEY POWELL (Hemsley).—3½ feet. Flowers 1⅜ inch diameter, bright rose-pink. Midseason.

Stellata type.

LISTERI (Wells).—3½ feet. Flowers 1⅜ inch diameter, pale rose-pink. Early midseason. Distinct from other stocks sent under this name (p. 340).

Sussex Beauty (raised by Messrs. Hemsley and sent by Messrs. Wood of Taplow, Messrs. Forbes, and Mr. Amos Perry). **H.C.** August 14, 1936.—5 feet. Plant compact; flowers 1½ inch diameter, light rose-pink. Late. Also sent in error as 'Rev. Page Roberts' by Messrs. Forbes.

H. BLANCHARD (Prichard, Ruys).—4 feet. Plant compact; flowers 1¾ inch diameter, light rose-pink; petals fringed. Midseason.

SUSSEX BEAUTY (Notcutt).—4½ feet. Flowers 1⅜ inch diameter, light rose-pink. Midseason. Distinct from other stocks sent under this name.

PEACH BLOSSOM (Stark).—4 feet. Flowers 1½ inch diameter, rose-pink. Midseason.

ALMOND BLOSSOM (Stark).—4 feet. Habit rather spreading; flowers 1⅜ inch diameter, rose-pink. Midseason.

Rev. Page Roberts (sent by Mr. W. Wells, jun.). **A.M.** July 16, 1936.—6 feet. Flowers 1½ inch diameter, rose-pink. Early midseason. Distinct from other stocks sent under this name.

REV. PAGE ROBERTS (Perry).—5 feet. Of spreading habit; flowers 1–1⅛ inch diameter, rose-pink. Early midseason.

Lowfield Pink (sent by Mr. Amos Perry and Mr. W. Wells, jun., Surrey). **A.M.** June 26, 1936.—6 feet. Plant spreading; flowers 1½ inch diameter, rose-pink. Early.

FLOWERS OF LILAC SHADES.

Grandiflora type.

Advance (raised and sent by Messrs. Stark of Fakenham, Norfolk). **H.C.** August 14, 1936.—4 feet. Plant compact; flowers 1⅝ inch diameter, rosy-lilac with a white centre. Midseason.

ATTRACTION (Stark).—5 feet. Plant compact; flowers 1⅜ inch diameter, rose-lilac shaded old rose. Midseason.

Stellata type.

EXQUISITE (Jones).—4½ feet. Flowers 1⅜ inch diameter, bright pinkish-lilac, centre lighter. Late.

LILAC SPRAY (Stark).—4½ feet. Flowers 1½ inch diameter, silvery rose-pink shaded lilac. Midseason.

ROSY GEM (Forbes).—3½ feet. Habit rather spreading; flowers 1½ inch diameter, rosy-lilac. Midseason.

FLOWERS OF PINKISH-MAUVE SHADES.

Grandiflora type.

SCARLET BEAUTY (Perry, Wells, Ruys).—3 feet. Flowers 1⅜ inch diameter, bright rich rose flushed mauve. Early midseason.

Stellata type.

COUNTESS (Jones).—5 feet. Habit rather spreading; flowers 1½ inch diameter, rose-pink flushed mauve. Early midseason.

CHARMING (Stark).—4 feet. Flowers 1⅜ inch diameter, rose-pink with a mauve flush. Midseason.

Success (raised and sent by Messrs. Stark). **A.M.** July 16, 1936.—4 feet. Habit compact; flowers 1½ inch diameter, rose flushed mauve. Late midseason.

FLOWERS ROSY-SALMON.

Grandiflora type.

The Jewel (raised and sent by Messrs. Stark). **H.C.** August 14, 1936.—3 feet. Compact habit; flowers 1¾ inch diameter, light rosy-salmon. Late midseason.

FLOWERS OF ROSE SHADES.

Grandiflora type.

FIRE QUEEN (Jones).—3 feet. Flowers 1½ inch diameter, glowing rose shaded salmon. Midseason.

LEADER (Jones).—3½ feet. Flowers 1½ inch diameter, rose. Early.

Interlaken (raised by Messrs. W. van Egmond and sent by Messrs. W. Wood and by Mr. R. C. Notcutt of Woodbridge, Suffolk). **A.M.** July 16, 1936.—4 feet. Plant erect, compact; flowers 1⅝ inch diameter, bright glowing rose. Early midseason.

Progress (raised and sent by Messrs. Jones of Bromborough, Cheshire). **A.M.** July 16, 1936.—3 feet. Plant compact; flowers 1½ inch diameter, deep rich rose. Early midseason.

Multiflora type.

SPLENDOUR (Jones).—3½ feet. Flowers 1⅜ inch diameter, light rose. Midseason.

ADMIRATION (Jones).—3 feet. Flowers 1 inch diameter, rose. Early.

SALMON QUEEN (Stark).—4½ feet. Flowers 1¼ inch diameter, dull old rose shaded salmon. Midseason.

MISS M. WALTER ANSON (Hemsley).—4½ feet. Flowers double, ⅞ inch diameter, dull rose. Midseason.

Stellata type.

JUNE GLORY (Jones).—3½ feet. Flower spikes very loose; flowers 1¼ inch diameter, light rose. Early.

EARLY ROSE (Stark).—3 feet. Flowers 1¼ inch diameter, light rose. Early.

ROSE QUEEN (Forbes, Perry, Wells).—6 feet. Flowers 1¼ inch diameter, light rose. Early midseason. Also sent as 'Treasure Holt' by Messrs. Hayward.

DAINTY (Stark).—3½ feet. Flowers 1¼ inch diameter, light rose, white centre; very free flowering. Midseason.

GRACEFUL (Stark).—4½ feet. Spreading; flowers 1¼ inch diameter, light rose. Midseason.

BRIGHT STAR (Jones).—3½ feet. Flowers starry, 1¼ inch diameter, light rose with a whitish centre. Midseason.

ROSY MORN (Stark).—4 feet. Flowers 1⅜ inch diameter, light rose shaded salmon. Midseason.

DAWN (Jones).—4 feet. Flowers 1⅓ inch diameter, light rose shaded salmon. Early midseason.

Doris Hemsley (raised and sent by Messrs. Hemsley). **A.M.** August 14, 1936.—5½ feet. Plant of compact habit; flowers 1½ inch diameter, light rose. Late.

MRS. PATTERSON (Perry).—5½ feet. Of spreading habit; flowers 1 inch diameter, rose. Midseason.

ROSE STAR (Stark).—4½ feet. Flowers 1⅝ inch diameter, glowing rose. Midseason.

Monarch (sent by Messrs. Forbes of Hawick; Perry, Middlesex; Wells, jun.; Ruys of Dedemsvaart, Holland; and R. C. Notcutt). **A.M.** August 14, 1936.—4 feet. Plant of compact habit; flowers 1½ inch diameter, bright rose. Late.

ROSIE (Stark).—4½ feet. Flowers 1⅜ inch diameter, rich rose. Midseason.

CHALLENGER (Jones).—4 feet. Flowers 1¼ inch diameter, rich rose. Midseason.

ROSE QUEEN (Notcutt).—5 feet. Flowers 1½ inch diameter, deep rich rose. Midseason. Distinct from other stocks sent under this name.

FLOWERS OF CARMINE SHADES.

Grandiflora type.

Glory (raised and sent by Messrs. Stark). **A.M.** July 16, 1936.—4½ feet. Plant erect, compact; flowers 1¾ inch diameter, bright rose-carmine. Midseason.

Little Gem (raised and sent by Messrs. Jones). **H.C.** July 16, 1936.—3½ feet. Plant of compact growth; flowers 1¾ inch diameter, rich rosy-carmine. Early midseason.

Wensleydale (sent by Messrs. Forbes and Mr. Amos Perry). **H.C.** August 14, 1936.—5 feet. Habit compact; flowers 1¾ inch diameter, rich rose-carmine. Midseason.

Mr. Lindbergh (raised by Messrs. W. van Egmond and sent by Messrs. Ruys). **A.M.** July 16, 1936.—3 feet. Plant of erect, compact habit; flowers 1¾ inch diameter, bright rich rose-carmine. Early midseason.

NIMMERDOR (Perry, Ruys).—Closely resembles 'Mr. Lindbergh' but with somewhat smaller flowers.

FIREMAN (Jones).—3 feet. Flowers 1½ inch diameter, bright rich rose-carmine. Midseason.

MRS. JAMES GALLOWAY (Hemsley).—4 feet. Flowers at times semi-double, 1½ inch diameter, bright rich rose-carmine. Early midseason.

DUCHESS (Jones).—4½ feet. Flowers 1⅝ inch diameter, bright rich rose-carmine. Midseason.

JUNE RUBY (Jones).—3 feet. Flowers 1¼ inch diameter, rich dull rose-carmine. Early.

BEAUTY (Stark).—4 feet. Flowers 1⅜ inch diameter, deep rose-carmine. Midseason.

CARMINE BEAUTY (Stark).—4½ feet. Flowers 1¼ inch diameter, deep rose-carmine. Late.

PRINCE (Jones).—4 feet. Flowers 1⅝ inch diameter, deep rich rose-carmine. Midseason.

MRS. HARRY BORRADAILLE (Hemsley, Ruys).—3 feet. Habit compact; flowers 1½ inch diameter, deep rich rosy-carmine. Early midseason.

Multiflora type.

Wonder (raised and sent by Messrs. Jones). **A.M.** July 16, 1936.—3 feet. Plant of erect, compact habit; flowers almost double, 1⅛ inch diameter, rosy-carmine. Midseason.

EARLY CARMINE (Stark).—2 feet. Flowers 1½ inch diameter, bright rosy-carmine. Early.

MULTIFLORA ROSEA (Stark).—3½ feet. Flowers 1 inch diameter, bright rich rose-carmine. Early midseason.

MRS. BARCLAY (Forbes).—3½ feet. Flowers fully double, ¾ inch diameter, dull rose-carmine. Early midseason.

Brilliant (raised by Messrs. W. van Egmond and sent by Messrs. Wood). **A.M.** July 16, 1936.—3½ feet. Plant of erect, very compact habit; flowers 1½ inch diameter, deep brilliant rose-carmine. Midseason.

CHIEFTAIN (Jones).—3½ feet. Flowers 1 inch diameter, a few semi-double, deep rich rose-carmine flushed ruby. Midseason.

Stellata type.

GOOD FORTUNE (Jones).—5 feet. Flowers 1¼ inch diameter, light rosy-carmine. Late.

PROFUSION (Jones).—4½ feet. Flowers 1⅜ inch diameter, rose-carmine. Midseason.

MRS. D. J. COLMAN (Stark).—5 feet. Flowers 1⅜ inch diameter, rose-carmine. Late.

MRS. CARL BENDIX (Hemsley).—3½ feet. Flowers 1½ inch diameter, bright rose-carmine. Early midseason.

DECORATOR (Stark).—3½ feet. Flowers 1¼ inch diameter, bright rose-carmine, centre white. Midseason.

CRIMSON KING (Stark).—5 feet. Flowers 1⅜ inch diameter, bright rosy-carmine. Late. Distinct from 'Crimson King' of other senders.

IMP (Jones).—4 feet. Flowers 1¼ inch diameter, bright rosy-carmine. Late.

CARMINE KING (Stark).—4 feet. Flowers 1¼ inch diameter, rich rosy-carmine. Midseason.

FREEDOM (Jones).—3½ feet. Flowers 1¼ inch diameter, a few semi-double, deep rose-carmine. Midseason.

CRIMSON WONDER (Wells).—4 feet. Flowers 1⅜ inch diameter, deep rose-carmine. Late.

RUBY (Forbes).—5 feet. Habit spreading; flowers 1¼ inch diameter, deep rose-carmine. Midseason.

MRS. REGINALD CORFIELD (Hemsley).—4 feet. Flowers 1⅜ inch diameter, deep rich rose-carmine. Midseason.

GARNET (Jones).—4½ feet. Flowers 1 inch diameter, deep dull ruby-carmine. Midseason.

FLOWERS OF RUBY-CARMINE SHADES.

Grandiflora type.

RUBY GEM (Stark).—3½ feet. Flowers 1½ inch diameter, some semi-double, mostly single, rich ruby-carmine. Midseason.

Multiflora type.

TILGATE GLORY (Hemsley).—3½ feet. Flowers semi-double, 1 inch diameter deep rich ruby-carmine. Midseason.

FLOWERS ROSY-RED.

Multiflora type.

CRIMSON KING (Wood, Forbes, Wells, Ruys).—5 feet. Flowers 1 inch diameter, dull rosy-red. Late. Distinct from other stocks sent under this name.

TRIAL OF SPREADERS AT WISLEY, 1937.

SPRAYING with liquids is at present one of the chief methods of checking certain fungus and insect attacks upon plants, and in many, probably most, instances it is imperative that the foliage should be wetted, and in many instances unless the insects it is sought to kill are wetted with the spray they remain uninjured.

Water and many of the usual spray fluids fail to wet either foliage or insects as completely as is desirable, for both are often protected from wetting by hairs or wax or a polished surface, and it is necessary to add something to the spray fluids to increase their wetting power.

Soap has frequently been used for this purpose, as in nicotine soft soap and the almost obsolete quassia and soft soap. There are drawbacks to the universal use of soap for the purpose, for with such important spray fluids as Bordeaux Mixture, Lead Arsenate, and Lime-Sulphur soap cannot be used, as chemical changes are brought about in its presence. Soap is also apt to dissolve the wax on leaves, such as those of Carnations and Silver Firs, and this is likely to be detrimental to the plant.

The requirements for an efficient spreader are that it shall increase the power of wetting in the liquid to which it is added, and also the power of holding minute solid particles in suspension; it must not react with the materials of the spray fluid; it must be easy to handle and mix, and not be liable to absorb moisture from the air, for this renders it difficult to measure accurately; it should not induce excessive frothing; it should be reasonable in cost.

Twenty-two different materials were sent for the trial by thirteen different firms.

Saponin was used as a standard against which to judge these spreaders as it most nearly fulfils all requirements. There are, in fact, many saponins derived from many different plants, *e.g. Saponaria officinalis, Quillaja Saponaria, Sapindus Saponaria, Chlorogalum pomeridianum, Gouania* sp., *Limonia* sp., and in many parts of the world the plants containing it furnish a substitute for soap, but the one referred to is that sold commercially under the name. Used at the rate of 1 part to 8,000 of spray it has remarkable spreading power.

The materials sent for trial were of various types, and the awards made were as follows:

Award of Merit.

Agral 2: Imperial Chemical Industries, Ltd.

*Potash Whale Oil Soap: Messrs. W. Pearson, Ltd.

Solignum Wetting Agent: Solignum Ltd.

* This is unsuitable for mixing with lime-sulphur, and plants sprayed with lime-sulphur to which this had been added were badly scorched.

Highly Commended.

Wettall Spreader (Dry) : Messrs. W. J. Craven & Co.

E.C.P. Liquid Wetter, Y. 3468 : Electro Chemical Processes, Ltd.

Sulpholeum Powder : The Strawson Chemical Co., Ltd.

Wetta Spreader : Messrs. W. Voss & Co., Ltd.

Spreadmax Improved : Messrs. G. Monro, Ltd.

Commended.

Bouisol Wetting Compound, Y. 3467 : Electro Chemical Processes, Ltd.

E.C.P. Sulphite Lye, Y. 367 : Electro Chemical Processes, Ltd.

Concentrated Sulphite Lye : Messrs. Lambeth & Co.

Lethalate Wetting Preparation Standard : Lunevale Products Ltd.

Amoa Wetting Agent : Amoa Chemical Co., Ltd.

BOOK REVIEWS.

"A Textbook of Plant Virus Diseases." By Kenneth M. Smith. 8vo. 615 pp. (Churchill, London, 1937.) 21*s*.

The author of this book on Plant Virus Diseases has already given us two books and various other publications on the subject. His book published in 1933, giving a survey of knowledge of plant viruses then existing, was a welcome addition to our literature. He has now produced this comprehensive volume containing further information gathered by research workers in recent years. The author has, by his own researches, contributed in no small degree to our present knowledge.

So much work is being done and so much literature on plant viruses is published every year, that it is difficult for those interested in plant disease problems to keep up to date in recognizing symptoms that can be ascribed to virus infection. All the world over these viruses are believed to be the cause of serious losses among both edible and ornamental plants, and any scientific contribution that will help in their identification and control is welcome to the plant pathologist. The work under discussion contains a vast amount of data which are of the utmost importance to those concerned with advisory work on plant disease.

The author devotes most of the preface to explaining his method of presentation of the subject. The system followed is to group together all the viruses known to be chiefly associated with a particular plant and to number these viruses 1, 2, 3, 4, etc. The host plants concerned with such groups are arranged after Hutchinson's system of classification.

In each group each virus is dealt with fully. First its properties are described—these include such matters as the serological reactions of the virus, its mode of transmission, its different hosts, its resistance to ageing or desiccation, its thermal death point, etc. Next we read full descriptions of its symptomatic effect on different plants, its geographical distribution and (where available) full details of suggested control measures.

There are nine chapters. Chapters 1–5 and 7 deal with the many and varied viruses which are known to occur on different kinds of plants, but Chapter 6 is devoted entirely to the potato and its numerous virus afflictions. Chapter 8 is concerned with insects to the extent of nearly 100 pages—this is not surprising when we remember the important role of insects as the chief agents in spreading virus diseases. So we are able to read detailed descriptions of the life-history, habits, food plants, geographical distribution, etc., of the insects concerned with the transmission of the viruses mentioned in the book. In most cases illustrations of the insects are also given.

Chapter 9 is an interesting one. It gives notes and descriptions of symptoms seen on various plants; symptoms which are suspected of being caused by virus infection but which still require further investigation.

There are 101 illustrations, some of which include as many as seven separate photographs of virus disease symptoms on various plants. The photographic reproduction and the print are excellent throughout.

A feature in the book that will be appreciated is the appendix. This comprises about 40 pages, and is in simple tabular form. In the first column is given a list of the more important plants, opposite each is a brief description of disease symptoms, and, in the third column, the name and page reference of the virus causing the trouble. This is intended as a help for the practical grower who may otherwise find difficulty in searching among the virus groupings in the text. Further information is easily obtained from the page reference found in this appendix.

After perusing its pages, the reader is impressed not only by what has been done, but by the amount that so obviously remains to be done. The importance of virus disease research is here plain to read, and we feel the author has provided us with a standard book on a most important subject. For such a work the price must be considered very reasonable.

D. E. GREEN.

"Gardeners Choice." By Evelyn Dunbar and Cyril Mahoney. 8vo. 222 pp. (Routledge, London.) 10*s*. 6*d*. net.

Why the gardeners chose the particular plants about which they write is not very clear, but they have given us a very pleasant account of a number of

herbaceous plants, a few shrubs, some lilies and other bulbous plants, with good advice about their cultivation.

Each of the plants described is well illustrated by a line drawing, some of the illustrations being admirable.

Many people will shake their heads when they read that *Campanula rapunculoides* is among the plants recommended, and, notwithstanding the able defence put forward for "this most insatiable and irrepressible of beautiful weeds," it is probable that any jury of gardeners would find the plant guilty of trespass at least, and that it would be ordered for deportation.

A chapter on the planning and planting of a small country or suburban garden is full of sound common sense, though the suggestion that a weeping Elm should be planted in a small garden is surely laying up trouble for the future, as all Elms are gross feeders and their roots travel long distances in search of food and moisture. A weeping Birch might take its place with advantage, and it would be less invasive.

It is a pity that greater care was not taken in correcting slips in the spelling of names of plants; and many of the references in the index are inaccurate.

"The Modern Greenhouse." By J. S. Dakers. 8vo. (Cassell, London, 1938.) 8*s*. 6*d*.

This handbook which includes twenty-three chapters deals with various types of greenhouses, including the greenhouse in spring, summer, autumn and winter; and with such diverse subjects as greenhouse climbers, foliage and decorative plants, shrubs and roses, chrysanthemums, carnations, bulbs, lilies, orchids, etc., as well as tomatos, cucumbers, melons and vegetables.

There is also a chapter dealing with the diseases and insect pests that commonly attack greenhouse plants. The cultural details throughout are clear, concise and eminently practical, such as should be easily understood by the beginner, enabling him to grow successfully a great variety of plants, especially as the book includes 60 diagrams illustrating a great variety of garden operations, varying from pricking off seedlings to staking and tying plants, which should make the various garden operations clear to the veriest tyro.

The book is also illustrated with 40 excellent half-tone plates.

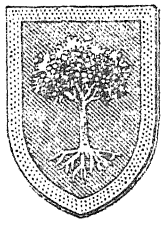
Coming to plant names, there are many mistakes in nomenclature; here the author would have been well advised to have had that portion edited by some competent authority, for even to the elect, the vexed question of plant nomenclature is full of pitfalls.

Throughout the text the term variety or varieties is constantly used when species is meant. There is also a considerable misuse of capitals, a few examples being *Primula Kewensis, Schizanthus Retusus, Eucharis Amazonica, Galanthus Byzantinus, Salvia Rutilans, Platycerium Alcicorne* (on the next page it is correctly given as *Platycerium alcicorne*). Then there is *Juniperus Bermudiana*; here *Juniperus bermudiana* is wrongly given as a synonym of *Cupressus funebris*. In other cases, such as *Celsia Arcturus, Clivia Gardenii, Asparagus Sprengeri, Daphne Mezereum* and *Lilium Martagon*, the capitals are omitted from the specific name. When dealing with Lilies, the specific name *Krameri* is used for *Lilium japonicum*; this is, perhaps, excusable as the former name is still common in gardens. *L. formosanum* is also wrongly given as a variety of *L. philippinense* which is wrongly spelt as *L. phillipinense*. The same mistake, or a double mistake occurs in the case of *Nephrolepis Phillipinense*; *Lilium Szovitsianum* is given as *L. Szovitzianum*, which, however, is a common mistake.

There are several mistakes in spelling, probably printer's errors; thus Bouvardia Alfred Neumer is given as B. Alfred Leuner, and on page 219 encrushed for encrusted Saxifraga.

J. COUTTS.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXIII  Part 8

August 1938

LIBRARY

SOME NOTES FOR FELLOWS.

THE importance of these notes (attention to which is drawn on the Fellows' tickets) is difficult to convey. Those Fellows who read them regularly without doubt appreciate the advantage of this monthly communication, and a special appeal is now made to them to assist the Society's administrative staff to advertise this importance. Much disappointment would have been saved many Fellows had they read the May and June numbers of the JOURNAL concerning the alteration of the date of the British Delphinium Society's Show.

PUBLICATIONS.

Attention is again drawn to the two very important publications of the Society which have appeared this year, one of which should certainly be in the hands of all those owning large and important gardens, and the other not only of such but also of those who are gradually forming and building up gardens. The first book is the Index to the JOURNAL (obtainable from the Offices of the Society, £1 paper bound, and £1 1s. in buckram) complete up to the year 1935, from which can be gathered not only references to nearly every kind of flower, fruit and vegetable of garden value, but also a list of the awards that have been given from time to time. The latter is of special value to those who exhibit at the Society's Shows.

The second book, Some Good Garden Plants (obtainable from the Society's Offices, price 4s.), is an illustrated publication, describing some of the best plants for the garden, together with cultural notes. All the plants recommended have been carefully reviewed and have been given the Award of Garden Merit.

CALENDAR.

There will be a demonstration at Wisley on the Vegetative Propagation of Plants on August 24 and 25 (2 to 4 P.M., weather permitting). Will those desiring to participate in this demonstration please inform the Director of the Gardens at an early date ?

The second Fortnightly Show of August will be held on August 30 (12 noon to 7.30 P.M.) and August 31 (10 A.M. to 5 P.M.).

On September 3 (2.30 to 8 P.M.) a Show will be held in the New Hall by the London Allotments and Gardens Show Society.

On September 6 (1 to 7.30 P.M.) and September 7 (10 A.M. to 5 P.M.) two Shows will be held : in the New Hall the National Dahlia Society's Show, and in the Old Hall the Alpine Garden Society's Show.

The National Rose Society will hold its Show in both the Society's Halls on September 9 (12 noon to 7 P.M.) and September 10 (11 A.M. to 5 P.M.).

A Fortnightly Show will be held on September 13 (12 noon to 7.30 P.M.) and September 14 (10 A.M. to 5 P.M.), and on this occasion a silver trophy, provided from Mrs. SHERMAN HOYT'S Prize Fund, is offered for the best group of Cacti and/or succulents staged by an amateur. Entries must be made on special forms obtainable from the Secretary, to whom the completed forms must be returned not later than by the first post on Wednesday, September 7.

At 3.30 P.M. on September 13 Mr. J. M. S. POTTER will lecture on "Plums."

On September 16 (2.30 to 9 P.M.) and September 17 (10 A.M. to 6.30 P.M.) the London Gardens Society's Show will be held in the New Hall.

Under the auspices of a Joint Committee of the Society and the National Chrysanthemum Society a standard collection of these flowers is already in existence at Wisley and will be maintained for the future, and trials of plants selected by the Committee will be conducted.

The National Chrysanthemum Society will hold a Show of Early-flowering Chrysanthemums on September 20 (1 to 8 P.M.) and September 21 (10 A.M. to 5 P.M.). This Show is not mentioned in the Society's Calendar but will be open to Fellows of the Society on showing their tickets.

Fellows are warned that Fellows' tickets will not admit to the National Chrysanthemum Society's Show on November 3 (1 to 7.30 P.M.) and November 4 (10 A.M. to 5 P.M.).

BRITISH FLORAL ART EXAMINATION.

The practical examination for the British Floral Art Diploma will be held on Wednesday and Thursday, September 28 and 29, in the Town Hall, Torquay.

FARRER'S WATER-COLOUR DRAWINGS.

The Society has received a very generous gift from Mr. S. J. FARRER of a collection of water-colour paintings of Tibetan and Chinese flowers by Mr. REGINALD FARRER, which will be of great interest to many of the Fellows. They will, in due course, be hung in one of the Committee Rooms in the New Hall, where they can be seen on Show Days or by request.

INTERNATIONAL HORTICULTURAL CONGRESS.

The Twelfth International Horticultural Congress will be held in Berlin from August 12 to August 17. It bids to be a very interesting one in view of the comprehensive programme which has been prepared, covering all horticultural subjects. The Society is sending a deputation to the Congress. Any Fellows interested in this Congress are asked to write as soon as possible to the Secretary, Dr. GUENTHER, XII Internationaler Gartenbaukongress, Schlieffenufer 21, Berlin, N.W.40, or a programme may be obtained from the Secretary of the Society.

EXAMINATION RESULTS.

Teachers' Preliminary Examination in School and Cottage Gardening, held on March 19, 1938.

Three hundred and forty candidates entered for this Examination, and of these

75	were placed in Class 1.
105	" " " 2.
84	" " " 3.
41	failed.
35	were absent.
340	

A Silver-gilt Medal is awarded to Mr. WILLIAM GEORGE HAZELL, of 23 Margaret Avenue, Bedworth, nr. Nuneaton, who was First.

Teachers' Advanced Examination in School and Cottage Gardening, held on June 9–10, 1938.

Thirty-one candidates entered for this Examination, and of these

17	passed.
12	failed.
2	were absent.
31	

National Diploma in Horticulture, Preliminary Examination, held on June 13–17, 1938.

One hundred and thirteen candidates entered for this Examination, and of these

50 passed.
56 failed.
7 were absent.

113

National Diploma in Horticulture, Final, Section 1 (General Horticulture), held on June 21–24, 1938.

Twenty-nine candidates entered for this Examination, and of these

10 passed.
19 failed.

29

Final, Section 6 (Gardening in Public Parks), held on June 28–29, 1938.

Seven candidates entered for this Examination, and of these

4 passed.
3 failed.

7

Final, Section 7 (Horticultural Inspection), held on June 28–29, 1938.

One candidate entered for this section and failed.

The following have been awarded the National Diploma in Horticulture:

Section 1.—General Horticulture.

Bultitude, John W.
Cherry, Charles E.
Coles, Miss Mary G.
Downes, William F.
Flegg, Oscar D.
Heley, Miss Kathleen F.
Hodgman, Miss Muriel G.
Hudson, John P.
Phillips, Horace J.
Treseder, Neil G.

Section 6.—Gardening in Public Parks.

Erskine, Robert.
Moore, Wilfred H.
Morse, Albert E.
Whitehead, Tom.

Wisley in August.

Among the Trials being conducted this year the following should be at their best for inspection this month. The annual plants comprise

Dimorphothecas, Godetias and Callistephus (China Asters); while perennials include varieties of *Aster Amellus*, Gladioli, *Lobelia fulgens*, Sidalceas and Montbretias. The Dahlias and early-flowering Chrysanthemums are likely to open their season towards the end of the month. All these will be found in the ground to the left of the Rose walk near the entrance gates, from whence visitors may pass to the border of Annuals facing the Pear orchard, or to the collection of hybrid Roses growing on each side of King's Avenue, leading towards the Alpine House.

At this late season many interesting plants cannot be expected in the Alpine House, but a few likely to be found in flower are such species of Campanula as *Campanula cashmerica* and *C. Hallii*, of Gentiana as the hybrid 'Devonhall' and *Gentiana saxosa*, the blue Wahlenbergias and graceful and long-lasting *Nierembergia frutescens*, whilst the bright orange fruits of *Nertera depressa* cover a pan of this prostrate carpeting plant.

On the rock garden there is more variety of plants to give colour now. Cyananthus and Gentiana species, together with the small but floriferous *Delphinium tatsienense* lend their different shades and tones of blue and are indispensable at this time of the year; scarlet is supplied by Zauschneria, set on a well-drained mound to suit its Californian or Mexican origin, and *Roscoea purpurea* var. *pallida* is an unusual plant of striking appearance. A notable shrub flowering this month on the lower slope of the rock garden is the Chilean *Eucryphia glutinosa* (*pinnatifolia*), about fifteen feet in height, bearing large white Hypericum-like flowers with a central tuft of conspicuous stamens.

Within the shade of the Wild Garden many Lilies are in bloom. Tallest of them all is the North American Swamp Lily, *Lilium superbum*, which may be ten feet in height, with a heavy load of spotted orange flowers; others, of lesser stature but no less ornamental in their place, are *L. Sargentiae* and *L. formosanum* among those with trumpet-shaped, white or cream-coloured flowers, and in the Martagon section with reflexed petals are *L. Humboldtii* with even larger and more notably spotted flowers than *L. superbum*, and the well-known Tiger Lily (*L. tigrinum*) which is especially at home in the Azalea garden. Apart from these Lilies the pale pink branching spikes of the Astilbes call for notice in one of the damper places, and *Gentiana asclepiadea*, the Willow Gentian, cannot be overlooked by anyone, as it grows in such profusion. Two noteworthy shrubs which flower in August are the tall white *Hoheria populnea* from New Zealand and the uncommon North American *Cyrilla racemiflora*, bearing clusters of long pendent racemes. In the Azalea bed in the Wild Garden *Tropaeolum speciosum* spreads its scarlet flowers far and wide without respect of plant or tree.

Of the shrubs in Seven Acres the principal to be mentioned for their flowers are Buddleias and *Koelreuteria paniculata*; the latter is a small tree growing on the east side of the pond near the Japanese

Cherries and Berberis, of which some of the latter will now begin to colour their berries. *Euonymus latifolius* is also one of the earliest to achieve this each year and carries large hanging 'Spindle Berries.'

A most attractive display is made by members of the Heather family in the Heath Garden at the west end of Seven Acres. Here are many of the numerous forms of the Common Ling (*Calluna vulgaris*), such as the crimson *Alportii*, downy grey *tomentosa* and golden-leaved *Serlei aurea*, besides varieties of *Erica cinerea*, of the Cornish Heath *E. vagans*, of *E. Tetralix*, the hybrid *E. Watsonii*, and the Connemara Heath, *Daboecia cantabrica* (*polifolia*) with its much larger purple or white bells.

In the Award of Merit Garden, which lies between Seven Acres, the Azalea Garden and the Wild Garden, are several plants of real decorative quality. One of these is the blue *Agapanthus africanus* var. *Mooreanus*, so often grown in tubs for placing on terrace or steps, but quite hardy here in the open border. Another is *Perowskia atriplicifolia*, one of the best of all grey-foliaged shrubs, with an added attraction in its spikes of lavender Sage-like flowers. Three useful perennials for cutting are *Helenium* 'Moerheim Beauty,' *Rudbeckia speciosa*, and *Monarda didyma* 'Cambridge Scarlet.' The herbaceous border is also full of bloom at this season and contains a very large selection of the most suitable plants for this popular feature of modern gardens.

Of plants in the large Temperate House perhaps the rose-pink Oleander, scented white Stephanotis, the blue-flowered *Plumbago capensis*, and climbing 'Morning Glory,' *Ipomaea Learii*, are the most noteworthy, together with that striking member of the Potato family, *Solanum Wendlandii*, trained on the eastern side of the house. In the smaller Half-Hardy House the purple fruits of *Billardiera longiflora* hang in a festoon from one of the supports and in the border beneath *Statice rosea* is both uncommon and pleasing to the eye.

Whilst it is not possible in these notes to indicate all the interesting plants which are in flower this month, visitors may be sure that they will find many others to attract attention in all parts of the Gardens, especially perhaps in the Rock Garden and herbaceous border.

Flower Books and Drawings.

An Exhibition of flower books and drawings has been arranged in the Victoria and Albert Museum, South Kensington, in the Book Production Gallery, to illustrate the pictorial treatment of flowers. The Exhibition is open daily from 10 A.M. to 6 P.M. (Sunday 2 to 6 P.M.), and will probably remain open until Christmas.

THE ECONOMIC RHUBARBS:

A Historical Survey of their Cultivation in Britain.

By Dorothy M. Turner, B.Sc. (Leeds), Dip. Hort. (Reading).

The genus Rheum consists of coarse- and large-leaved perennials to which the common name Rhubarb is applied. Many of the species are highly decorative in appearance, and certain of them are valued for their medicinal and culinary qualities. Most of the members of the genus are native to the northern and central districts of Asia, more especially Siberia, the Volga basin, Mongolia, Chinese Tartary, Tibet and Northern India. Some are also found in Persia and Asia Minor, but none is indigenous to Europe.

The medicinal use of Rhubarb dates from very early times, the earliest known record being that found in the Chinese herbal of Pen-king, about 2700 B.C. It is probable that the knowledge of its medical properties spread westward from China to Arabia, where it was listed in the medical lore of the Arabs as a purgative and tonic,[1]* and from thence through the near East to Europe. Pliny[2, 3] knew it as the *Rhacoma* root, believed to grow beyond the Pontus, and the drug which was derived from the dried root seems to have been the same as that used by Dioscorides,[3] physician to Antony and Cleopatra. He wrote of it as "*Rhia* or *Rheon*, the Rhapontic root growing in the lands beyond the Bosphorus, from whence it is imported." Celsus[4] also wrote of the *Radix pontica* as the root imported from the banks of the river Rha. Paulus Aegineta was amongst the first to employ it as a purgative, and by the beginning of the Christian era it was in common use in Roman and Greek medicine.[5] Marcellinus,[1] writing in the fourth century, stated definitely that the Rha was a river, on the borders of which grew a plant which carried the same name and whose root was famous in medicine. The Rha is now identified as the River Volga.

The name, Rhubarb, may most probably have been derived in this way. *Rha* from the river which gave its name to the plant growing on its banks and *barbarum* from the barbarian district beyond the immediate confines of the Roman Empire. This would suggest *Rha-barbarum*, the plant from the barbarian countries. As many of the roots were imported from the Pontus district this may have been the source of the term *Rhaponticum*. Both Guibourt[6] and Geiger[7] thought that the two names might have been used independently to designate two different sources, viz. *Rha-ponticum*, the plant from the

* These figures refer to entries in the Bibliography at the end of this article.

regions of the Pontus Euxinius and *Rha-barbarum*, that derived from Tartary, then included in the Roman category of barbarian. As it is now believed that the so-called Chinese or Tartary Rhubarb was first brought to Europe by MARCO POLO [8] in the thirteenth century, their premise is doubtful, although the prepared material, as imported, was never uniform. There is also some evidence of the use of *Rheu*, a root, thus suggesting *Rheu-barbarum* or *Rha-barbarum*, the root from the barbarian country. A Greek derivation is also possible, based on the Gr. *rheo*, I flow, whereby the purgative nature of the drug may have been emphasized. PARKINSON,[10] who suggested several alternative derivations for *Rha-barbarum*, concluded that the word was a linkage between the Greek *Rha* and the Roman *barbarum*, designating a plant from remote nations. He inclined to the opinion that the plant took its name primarily from the river Rha but did not overlook the possibility of derivation from the Arabic from which the name *Raued* or *Rhaved*, frequently used in the Near East, might have arisen. The early English herbals referred to the plant as *Rhapontic* or *Rheubarbe*, regardless of the place of origin, and it is from the latter term that the version *Rhubarb* is finally derived.

Towards the end of the Middle Ages the demand in Europe for Rhubarb roots was so great that a steady trade was maintained between Central Asia and the Mediterranean ports. The lack of uniformity in the colour and texture of the dried roots and the quality of the drug yielded convinced the merchants that more than one species of Rheum was being exported under the various names of *Rha barbarum*, *de Rahpontica*, *Radix ponticum*, *Rhaponticum* or *Rheubarbe*. As only prepared roots reached Europe there was no means of ascertaining which or how many species were imported.

The first Rhubarb to be cultivated in Europe was undoubtedly *Rheum Rhaponticum*. A native of the Volga basin, its introduction as a living plant was at one time attributed to PROSPER ALPINUS,[11] who received plants from FRANCISCUS GRASSUS in 1608 and grew them in the Botanic Gardens of Padua. GRASSUS is thought to have obtained them from the Rilo mountains of Bulgaria.[5] There is evidence, however, that plants were in cultivation in Europe previous to that date, for MORREN [1] was known as a grower of Rhubarb in 1573. GIBAULT [1] suggests that even his claim to priority is doubtful for, about 1570, *R. Rhaponticum* was grown in Germany by ADOLP OCCO, a physician and pharmacist who was the author of the leading pharmacopœia of his day.

The date of the appearance of *R. Rhaponticum* in England is uncertain. There was no reference to it in TUSSER'S first publication of A Hundred Points of Good Husbandrie,[12] but in the 1573 and subsequent editions he included it among the necessary herbs to grow for physic. As the term " Rhubarb," when applied to physic plants, was then somewhat vague, TUSSER'S Rhubarb may have been one of the plants later included under the bastard Rhubarbs. There is, however, a strong probability that he received roots of *R. Rhaponticum*

from Europe, more especially as the position of his farm in Essex would bring him in contact with ships trading between England and the Continent.

LYTE'S English translation of DODOENS' Historie of plantes,[13] referred to Rhubarb as "a strange plant found in the gardens of certain diligent herbalists which is thought by some to be Rha or Rhabarbarum," whereby it may be inferred that the plant was then growing in Holland and possibly in England. GERARD[14] also described it in The Herball, but only as a dried product under the title of "Rha Ponticum Siccatum," although he commented upon the occasional use of the leaves as a sauce for meat.

In 1629 PARKINSON made the first concrete contribution to our knowledge of Rhubarb cultivation in this country. LISTER, the English physician, whilst travelling in Italy, saw *R. Rhaponticum* growing in Padua and sent specimens to PARKINSON as *Rhaponticum verum*. A very brief description of the plant appeared in the Paradisus Terrestris,[15] but in the 1640 edition of the Theatrum Botanicum[10] PARKINSON described it fully as the True, Pontic, or English Rhubarb. He used the latter term to distinguish the home-grown from the imported product and identified it with the *Rhaponticum Thracium* of ALPINUS, the Rhapontic Rhubarb of the druggists and the *Rha Ponticum* of the ancients. PARKINSON was concerned primarily with the medicinal value of the roots, but he was also aware of the fine, tart or sourish flavour of the leaves, although not of the culinary use of the stalks.

CULPEPPER[16] knew *R. Rhaponticum* as Rhapontic Rhubarb and a full description of it appeared in the later editions of his Complete Herball, where the English-grown plants were claimed to be the equal in medicinal value of any imported from China. RAY[17] also spoke of the acid stalks as being more grateful than Sorrel.

None of the early writers seems to have been aware of the cooking possibilities of *R. Rhaponticum*. Its cultivation was confined almost entirely to the physic gardens of apothecaries and herbalists, and its value was determined solely by the amount and quality of the drug yielded by its roots. The date when Rhubarb was first employed in English cookery cannot definitely be ascertained, but it must have come into general usage during the first half of the eighteenth century. PHILIP MILLER[18] referred to it in 1768 when he described the stalks of *R. Rhaponticum* as being "now extensively grown for use in making tarts as well as roots to supply the drug." HANBURY[19] and MAWE[20] both made similar observations. We are indebted to MILLER for the most comprehensive account of the Rhubarbs growing in England at that period. The first editions of his Gardener's Dictionary, 1724 and 1731, made no reference to the culinary use of Rhubarb, but in a French edition of 1765 and the third English edition of 1768 MILLER gave a detailed account of the following five species: *R. Rhaponticum*, *R. Ribes*, *R. undulatum*, *R. compactum* and *R. palmatum*.

R. Rhaponticum had long been cultivated in England and MILLER'S

description was confined to the botanical characters and the statement, quoted above, as to its culinary use. He considered it synonymous with the *R. Rhaponticum* of ALPINUS and the English Rhubarb of PARKINSON.

R. Ribes, the Warted or Currant Rhubarb, had been known for many centuries. Travellers in the East recognized it as a species of fine and delicate flavour and valued it highly. In the thirteenth century IBN-EL-BEITHAR [1] reported it as being of common occurrence in Syria and Persia where its fleshy midribs were considered a great delicacy. RAUWOLF [21] saw it growing in Lebanon in 1573 and called it *Ribâs arebum*, and it was then a recognized article of food. MILLER attributed its introduction into England to the Rev. POCOCK, Bishop of Offory, who brought specimens to this country in 1724. It never became very popular, possibly because it was not very hardy. According to DECAISNE and NAUDIN [22] it was grown for food in France, but was inferior to some of the other species, although later it was valued more highly.[23]

The specific name, *Ribes*, is of mixed origin. The Arabic or Persian derivation, *Ribâs*, may have influenced it but also the stalks have a distinct flavour of currants. It was for this reason, as well as for the resemblance between the Arabic name and the Latin term, *Ribes*, that LINNAEUS adopted the generic term for Currants and named this Rhubarb *R. Ribes*.[1]

The cultivation in Europe, and more especially in England, of *R. compactum*, *R. undulatum* and *R. palmatum* was largely dependent upon the trading agreements between China and Russia. In 1653 China permitted Russian trading across her frontiers, with the result that the entire Chinese Rhubarb trade was deflected from the Mediterranean ports to Moscow and from thence to Europe. In 1704 the trade became the monopoly of the Russian royal house and the exported roots were then designated Crown or Russian Rhubarb. The Russians took the Rhubarb industry very seriously, and from 1728 a great deal of governmental control was exercised. Only the best material left the country and a very high standard of quality was maintained.[24] The trade remained in Russian hands until the Northern Chinese ports were opened to European commerce, when prepared Chinese roots were offered at a lower price than the Russian article. Although less care was exercised in the selection and preparation of the Chinese Rhubarb, there was a gradual drop in the supplies exported from Russia until, by 1860, very little Russian Rhubarb was on the market.

In 1732 seeds of so-called Muscovite Rhubarb were sent from Russia to RAND at the Chelsea Physic Garden, JUSSIEU in Paris and LINNAEUS at Upsala.[25] The resultant plants differed markedly from *R. Rhaponticum* and LINNAEUS temporarily named them *R. Rhabarbarum*. A year or two later, about 1740, Russian officials obtained a sample of seeds from China,[26] which were believed to be those of the " true " or exported Rhubarb. These also proved to be *R. Rhabarbarum*. LINNAEUS

renamed this species *R. undulatum* on the basis of the marked undulation of the leaf margins.

MILLER,[18] in 1758, received a parcel of seeds from Russia taken, he believed, from Chinese plants growing *in situ*. He raised a number of plants from them, and although they were all of one species they were neither *R. Rhaponticum* nor *R. undulatum*. LINNAEUS subsequently identified them as *R. compactum*. This species was not of great economic value in this country, although it was grown to some extent in France, where it was largely used in the silk-dyeing industry of Lyons.[24] It may have played its part, however, in the development of those varieties and hybrids which were later substituted for the species in the commercial production of culinary Rhubarb. It is now known to be native in Siberia and not China, as was supposed by MILLER and LINNAEUS.

BOERHAAVE,[18, 25] Director of the Leiden Botanic Garden, in 1759 received seeds which had been sent from China by a Russian Rhubarb merchant who collected them from the actual plants from which the dried article was prepared. Some of these seeds were forwarded by BOERHAAVE to MILLER under the title *Rhabarbarum Chinense verum*. The progeny was of two kinds, *R. undulatum* and a species hitherto unknown in Europe, which was characterized by its hairy and deeply palmated leaves. DE GORTER sent seeds from it to LINNAEUS at Upsala, but the seedlings did not survive. It was not until mature plants were sent in 1768 that this species was described by the younger LINNAEUS and included in the second edition of the Species Plantarum as *R. palmatum*.

MILLER never saw *R. palmatum* in flower. Writing of these introductions, he ventured the opinion that *R. undulatum* might be merely a variety of *R. Rhaponticum* and not an independent species. He based his theory upon the fact that he found so little difference between the plants when grown at Chelsea. LINNAEUS, on the other hand, was convinced that *R. undulatum* was an independent species and the true Rhubarb exported from China. Many years later this species was proved to be native in Western Siberia and not to be the Chinese Rhubarb as LINNAEUS supposed.[27] The appearance, however, of these three distinct species among the imported seeds, in addition to *R. Rhaponticum*, amply confirmed the opinion of the early merchants that medicinal Rhubarb, as imported into Europe, was a mixed sample.

MILLER also reported a case of so-called hybridization between *R. Rhaponticum* and *R. undulatum*, but as he gave no details it is not possible to determine whether there could be any relation between it and the later introduction, *R. hybridum*.

Rhubarb seeds reached England in 1762 from another Russian source. Sir ALEX. DICK, President of the Edinburgh College of Physicians, asked Dr. MOUNSEY, the English physician to the Russian Court, to grow the medicinal Rhubarb in the Royal gardens at St. Petersburgh. Dr. MOUNSEY grew some very good specimens which seeded freely. On his return to England he distributed these

seeds between Sir ALEX. DICK, Dr. HOPE of the Edinburgh Botanical Gardens, Prof. MARTIN of Cambridge, PHILIP MILLER and several other friends. Excellent plants were obtained, all of which were subsequently proved to be *R. palmatum*. In 1765 Dr. HOPE read a paper before the Royal Society on this new species of Rhubarb, popularly called Chinese, which was growing in the Edinburgh Botanical Gardens.

The introduction of *R. palmatum* aroused considerable interest, more especially as its roots produced a drug of high standard. It seemed possible that this country might become independent of the Russian imports if cultivation could be extended to meet the demand. Every encouragement to this end was given by the Society for the Encouragement of Arts, Manufactures and Commerce,[30] and by the Bath Society for the Encouragement of Agriculture,[31] and from 1770 to 1800 gold and silver medals and substantial premiums were offered for roots of high quality. The cultivation of *R. palmatum* spread. The crop was not confined to the recognized herbalists and physic gardens nor to any particular district. Large quantities were grown by market gardeners, farmers and many other interested persons as well as by surgeons and apothecaries. Sir WM. FORDYCE [28] grew it extensively at Putney and placed the first sample of the English-grown drug on the market. For this he was awarded a gold medal, as later were Sir ALEX. DICK, NATHANIEL JARMAN, ROBERT DAVIS, JOHN BALL, WM. HAYWARD, THOS. JONES, THOS. HALLEY, NICHOLAS ASHTON and the Rev. JAS. STILLINGFLEET.[29] Around Edinburgh a sufficient quantity was grown to supply the local hospital requirements. In England it was widely distributed, and the county surveys of that period record varying acreages in Somerset, Dorset, Oxfordshire, Middlesex, Surrey, Sussex, Buckinghamshire, Norfolk, Derbyshire, Lancashire and the East and West Ridings of Yorkshire.

The Society for the Encouragement of Arts endeavoured not only to maintain the standard of quality but to increase the quantity produced. Further premiums were therefore offered for bulk of crop, and by the beginning of the nineteenth century a considerable amount of *R. palmatum* was being grown. The drug obtained was so much superior to that yielded by *R. Rhaponticum* that the latter was in danger of going out of cultivation, had it not been for its increasing popularity in the kitchen. *R. palmatum* proved insipid when cooked, although Dr. A. FOTHERGILL,[31] referring to it as the " recent " plant, pointed out that in Tartary it was valued highly as food. It was also used in France where the stems were peeled and boiled with sugar or honey to make a conserve of mild laxative properties and pleasant flavour, and the young leaves were used in soups as substitutes for sorrel. In 1800 the Society of Arts withdrew its support and its premiums. The cultivation of *R. palmatum* on a commercial scale then began to decline rapidly. This probability had been forecast by Dr. J. FOTHERGILL [31] as early as 1783, when he questioned whether the English-grown drug would ever compete successfully with the

carefully selected imported article. The roots require skilled preparation and there is no doubt that the more attractive Russian product was preferred by the druggists.

The extent to which *R. palmatum* had gone out of cultivation is reflected in a brief note published in the Gardeners' Chronicle of 1867.[32] The plant was recommended for ornamental planting but was so scarce that it was questioned whether roots could be obtained in England, although it was not uncommon in small Dublin gardens. PREJEVALSKI [33] discovered it growing wild in Mongolia in 1872 and it can be said to have been reintroduced by him. A variety of *R. palmatum, R. palmatum tanguticum*,[34] was discovered about 1874 in the Tangut district of Kansu. VON REGEL believed this to be the most genuine of the medicinal Rhubarbs, and the drug obtained from its roots was certainly superior to that obtained from the species.

BAILLON,[35] in 1874, introduced another palmate-leaved form under the title of *R. officinale*. This species was native to Tibet and was particularly interesting for, in BAILLON'S opinion, it was the genuine Chinese Rhubarb. The plant was first grown in England by DANIEL HANBURY [36] and, together with a small amount of *R. Rhaponticum*, it gradually replaced *R. palmatum* as the source of such medicinal Rhubarb as was grown in this country—in 1884, upwards of five tons.[37] HOLMES,[38] writing in 1914 of the Rheums grown in this country for medical use, only included *R. officinale, R. Rhaponticum* and *R. palmatum* var. *tanguticum*. The late Mr. WM. HALES of the Chelsea Physic Gardens found *R. officinale* quite palatable when cooked, although in his opinion it could in no way compete with the existing culinary varieties.

Until the beginning of the nineteenth century the consumption of Rhubarb as an article of diet was not at all popular. Early horticultural writers made singularly few references to the plant, despite the fact that *R. Rhaponticum* had been grown in kitchen gardens for many years. Where it was mentioned it was dismissed briefly as a physic plant or included amongst the perennial flowers for ornamental planting. The stalks of both *R. Rhaponticum* and *R. undulatum* are edible, but the discovery of *R. hybridum*, between 1771 and 1779, introduced another culinary species. The true origin of this species is obscure; to some extent it resembles *R. palmatum* in habit, leaf shape and hairiness, but the stalks are quite palatable. MURRAY [39] believed it to be native in N. Asia but reports of cases of hybridization raise the question of a more local origin.

An unsigned letter from Norwich [31] records the following: "In the summer of 1771 a plant of *R. palmatum* was growing four yards from *R. compactum* and both were in flower at the same time. Seeds were collected from the *R. palmatum* when ripe. The resulting seedlings gave leaves which were neither *R. palmatum* nor *R. compactum* but a perfect mixture of both. All these flowered in 1775, but although the seeds appeared to be perfectly formed none ever produced plants. The medicinal qualities of these plants were very clearly

those of *R. palmatum* although perhaps a little milder and more palatable."

PULTENEY [31] reported, in 1783, that *R. palmatum* and *R. undulatum* would hybridize and hybrids of these two species were again referred to by Dr. A. FOTHERGILL [31] in 1786. In the same year CUMMING reported that he had amongst his Rhubarbs, in Dorchester, a so-called *R. palmatum* which showed a strong resemblance to *R. Rhaponticum*. WM. HAYWARD, a grower of medicinal Rhubarb in Banbury, in 1794 had a stock which appeared to be a hybrid of *R. Rhaponticum* and *R. undulatum*. GIBAULT [1] also suggests that *R. hybridum* might be a hybrid of *R. Rhaponticum* and *R. palmatum*. The problem of classification has been further complicated by the appearance of spontaneous hybrids between the two species *R. officinale* and *R. Collinianum*.[40] These were found in the gardens of the Paris Faculty of Medicine in 1883 and were quite fertile. Some of the plants were so different in their characters that they almost merited classification as new species. In some cases, in fact, the differences between the progeny and their parents, and between each other, were more marked than those between many of the recognized species. Some of these hybrids, especially that designated " Florentin," proved to be edible and most of them were distinctly ornamental.

The appearance of these hybrid characters led BAILLON to question whether such species as *R. hybridum* and *R. Collinianum* or *R. palmatum* and *R. officinale* might have originated, at a not very remote date, from one common stock. More recently [41] the behaviour of other so-called species would seem to suggest a hybrid constitution, and a review of the position of the species in Rheum might well be considered.

R. hybridum was popularized as a culinary plant by DICKSON [42] in 1800–4. The stalks were much larger and more succulent than those of *R. Rhaponticum* although of not so fine a flavour. *R. undulatum* did not yield so heavy a crop as either of the other two species, but as it carried an exceptionally good colour it was probably used as a parent of those varieties with conspicuously red leaf-stalks which were introduced later. At first these species were only grown in private gardens and by a few market gardeners for a very restricted local trade. There was no great demand for Rhubarb, although an early Agricultural Report for Perthshire hinted that the crop might present great scope in the future. About 1810 [43] the first consignment reached the London market, but of the five bundles sent only three were sold. This consignment is believed to have been *R. undulatum*. Public interest was aroused, however, in the new fruit or vegetable —its category was undefined—and by 1820 the MYATTS of Deptford and Lewisham were supplying the market regularly. The crop consisted solely of the green or garden Rhubarb, the stalks of which were often only finger thick and so coarse and rank that they had to be peeled and mixed with early Gooseberries or late Apples to render them palatable.[44]

In 1817, HARE [45] read a paper on the blanching of young Rhubarb shoots, a more or less accidental discovery at Chelsea. This opened

out a new field for Rhubarb cultivation, which was still further extended by KNIGHT's [46] report on his success in forcing Rhubarb by the methods used for blanching Sea Kale. In 1820, JUDD [47] contributed a further paper on the forcing of Rhubarb, and in 1824 a silver medal was awarded to JAS. SMITH,[48] a Scottish gardener, who adapted KNIGHT's method so as to force Rhubarb throughout the winter. Forced Rhubarb thus became an established crop. SMITH used *R. hybridum*, and by lifting the roots in January and placing them in a mushroom house, he was able to maintain " an abundant supply of succulent stalks which were thin-skinned, very tender and of exquisite flavour." Four years later JAS. STEWART [49] received a silver medal for the forcing of *R. Rhaponticum*. He found it to be about fourteen days earlier than *R. undulatum* and particularly adaptable for forcing. By beginning operations in early to mid December he produced his crop by January 1 and had a steady demand for his product.

WILMOTT, a London Strawberry grower, began to market Rhubarb in quantity in 1830, and its cultivation then spread rapidly throughout the market gardens of Deptford, Lewisham, Kew, Camberwell, Fulham and Mitcham. It is estimated that in 1831, more than one hundred acres round London were under culinary Rhubarb. The larger part of the crop was sold " green," but the marked differences between the delicate flavour and texture of the forced product and the coarseness of the green brought an increasing demand for the former. These differences, without doubt, did much to stimulate the introduction of improved varieties.

R. undulatum was the first species to receive attention, and in 1825 two varieties of it appeared under the names of ' Buck's Early Red ' and the ' Elford.' These were raised by WM. BUCK, gardener to the Honourable GREVILLE HOWARD, of Elford, Staffs. By reason of their colour, flavour and fine forcing qualities they became very popular and soon supplanted the species. The ' Elford ' seems to have been lost but ' Buck's Early Red ' is still in cultivation and was Highly Commended as an early variety in the R.H.S. trials of 1928–29.

Neither *R. hybridum* nor *R. Rhaponticum* were ideal forcing plants, mainly on account of the naturally whippy growth of the leaf stalks. They were, therefore, gradually replaced by a number of new varieties which more nearly satisfied the growers' requirements. There was a tendency for each grower to select his own stock, concentrating upon an increase in size and colour of stalk, a more delicate flavour and a reduction in fibre content. As a result, most of these introductions were selections from haphazard crossings and their parentages were seldom recorded. In view, also, of the doubtful origin of *R. hybridum*, which was often used as a parent, it is now practically impossible to determine their constitution. As the plants were increased vegetatively, however, the mixed parentage was of little importance as far as the maintenance of the stock was concerned and many of these old varieties are still grown.

WILMOTT [1] brought out a variety bearing his name and RADFORD

followed, in 1831, with 'Scarlet Goliath.' TOWERS[50] spoke of its immense size and weight and its popularity in the London area. It seems to have been a great improvement on the thin growth and harsh flavour of the Rhubarbs then in general cultivation, and a further note in 1839[44] eulogized its size, colour and tenderness. Some stress was laid on the fact that the stalks were better not peeled, which suggests that much of the objectionable coarseness had already been lost.

TOWERS[51] also listed two other varieties which he considered worth growing, more especially for forcing. These were 'Buck's Early Scarlet' (syn. 'Buck's Early Red'), already well known, and a new variety, 'Youell's Tobolsk' or 'Tobolsk Early Red.' The history of this variety is interesting. Legend has it that it was imported direct from Russia. It was first distributed in this country, however, by Messrs. YOUELL,[52] of Great Yarmouth, who, in 1843, claimed it to be one of the earliest varieties and an excellent forcer. It was outstanding for the deep colour of its slender stalks, its small size and its characteristic flavour of plums. VILMORIN,[53] describing it at a much later date, also commented upon its deep colour and extreme earliness. It had gone out of cultivation to a very great extent by the end of the last century, but was reintroduced a few years ago by the late Rev. W. WILKS, who had plants sent to him from Ireland. He found that it had not lost any of its desirable characters and he exhibited it at the R.H.S. in 1919.

There is existent in many gardens, especially in the north of England, a variety of Rhubarb known locally as 'Cherry,' which appears to resemble 'Tobolsk Early Red' in certain of its features. It also has a distinctive flavour of Cherries or Plums. The writer has been unable to trace the origin of this 'Cherry' variety; in all cases enquiry has only elicited the information that the plants have been acquired as a gift from some existing stock. Messrs. KELWAY, of Langport, have also a variety, 'Crimson Queen,' which has a pleasant flavour of Cherries when cooked, and it, too, is characterized by its deep colour, earliness and small size. Its history is not known, although it has been in cultivation for at least forty years. How far these two varieties carry some of the Tobolsk characters is difficult to conjecture, but it is possible that this very old variety is more widely distributed than has hitherto been believed.

The most popular varieties were introduced by JOSEPH MYATT, Manor Farm, Deptford, and his contributions proved to be the most suitable for the market trade. About 1837 he raised 'Victoria' (syn. 'Queen Victoria'), and followed within a year or two with 'Prince Albert' and 'British Queen.' The latter, which is now out of cultivation, had a brief popularity and was probably named by MYATT after the steam packet of that name which was built at Deptford for the American trade. Shortly afterwards he introduced 'Linnaeus.' MYATT does not appear to have recorded the source of his introductions although STURTEVANT[54] was of the opinion that

'Victoria' was derived from *R. hybridum*. ROBINSON [55] also considered that 'Victoria,' 'Linnaeus,' and the later introductions, Mitchell's 'Royal Albert,' 'Monarch' and 'Champagne,' were all derived from this species.

Both 'Victoria' and 'Linnaeus' became very popular for they proved to be good general purpose varieties, sufficiently tender and fine flavoured to be marketed green and still excellent forcers. As early as 1840 'Victoria' was considered superior to 'Goliath' and 'Tobolsk Early Red,' and it is still a great favourite amongst market growers. The existing stocks of 'Victoria' are comparatively uniform, but it is somewhat difficult to estimate how far the present 'Linnaeus' differs from the original introduction. It is certain that there are varieties known under that name which in no way resemble the 'Linnaeus' of MYATT.

HAWKES, of Loam Pit Hill, Lewisham, raised several new varieties. The best of these was 'Champagne,' an early red which became, and still is, very popular in the London area. It is primarily a garden variety and does not yield a heavy crop when forced.

From 1840 to 1850 several new varieties of deep colour and good forcing qualities appeared. Of these the best known was 'Dully's Scarlet Admirable,' which was then in great demand at Covent Garden. [56] JAMES STOTT, of Alnwick, raised 'Monarch' from 'Victoria' in 1851,[57] and although its immense size tended somewhat to coarseness of texture it was extensively forced. In 1855 M'INTOSH [42] listed eight varieties as worthy of cultivation. These included, in addition to 'Victoria,' 'Prince Albert,' 'Linnaeus,' 'Champagne' and 'Monarch,' the newer varieties Mitchell's 'Grey Eagle,' 'Randall's Early Prolific' and 'Britannia.' MITCHELL also introduced a variety under the name of 'Royal Albert' (syn. 'Early Albert' and 'Early Red'). This must not be confused with the 'Prince Albert' of MYATT, which may also be listed as 'Royal Albert.' At the present time it is a popular early forcing variety amongst the market growers. 'Dancer's Early Scarlet' appeared about the same time and was first included in the catalogues of the early sixties. 'Johnston's St. Martin,' which was raised in a private garden in Cheshire, followed about ten years later.

These constituted the best-known varieties, but there were many others. Some of these were of probable value, but a great many seem to have been synonyms of existing varieties. In 1882 the R.H.S. deemed the time ripe for trials, and these were laid down at Chiswick. How necessary this had become can be realized by the fact that the variety in greatest demand at Covent Garden, the 'Early Red,' was grown and marketed under at least a dozen names.[58]

The trials did much to eliminate the confusion of names.[59] It was found that the culinary Rhubarbs could be grouped broadly on the basis of time of maturity and the shape of the leaf-stalk. The earliest variety was 'Early Red' or 'Albert' (syn. 'Mitchell's Royal Albert'). It was distinguished by the concave upper side of the leaf-stalk, and was the most popular early commercial variety. Its many synonyms included

'Prince Albert,' 'Salt's Crimson,' 'Perfection,' 'Linnaeus' (Barr), 'Scotch Mammoth,' 'Early Scarlet,' and possibly 'Dully's Scarlet Admirable.' An early variety is in cultivation in the north of England under the names of 'Prince Albert' or 'Early Albert,' but in the opinion of some of the West Riding growers this approximates more closely to 'Linnaeus' or a strain of it. The next group matured slightly later than the 'Early Red' and had a groove on the upper side of the leaf-stalk. This was designated the 'Linnaeus' or 'Johnston's St. Martin' type. It also had a number of synonyms, including 'Buckley's Crimson,' 'Goliath,' 'Victoria' (Lawson) and 'Salt's New Empress.' 'Buck's Early Red' stood alone and was dwarf in habit when compared with the 'Early Red' of the market growers. 'Dancer's Early Red' and 'Hawkes' Champagne' were distinct varieties, but 'Baldey's Scarlet Defiance' and 'Carter's Crimson Perfection' were identical. The late varieties formed the Victoria group and of these 'Victoria' (Myatt), 'Queen Victoria,' 'Victoria' (Barr) and 'Johnston's St. Martin' (Osborn) were synonymous. 'Stott's Monarch' was an independent variety without synonym and was the latest of all. Of the varieties under trial 'Hawkes' Champagne' was conspicuous for its colour, texture and flavour, and was awarded a First Class Certificate.

A report on independent trials in Norwich, issued the same year,[60] suggested the following classification for the more popular varieties: earliest, 'Royal Albert'; then 'Scarlet Defiance' with 'Champagne' a little later; 'Linnaeus' and 'Johnston's St. Martin' as mid-season varieties, followed by 'Paragon' and 'Victoria,' with 'Stott's Monarch' as the latest of all. 'Paragon' was raised in Yorkshire about 1878 by Kershaw, Sledsyke Nurseries, Brighouse. It was not a very popular market variety, although some seed is still available.

The principal kinds marketed in Covent Garden in the 'eighties were 'Royal Albert,' 'Victoria,' 'Hawkes' Champagne' and 'Linnaeus,' but towards the end of the century two other very good varieties were introduced. These were 'Daw's Champagne' and 'The Sutton.' The writer is indebted to Mr. J. POUPART for the information he has supplied about the origin of these. In an extract from one of his letters he says "My late father, Mr. W. POUPART, his brother JOHN and Mr. A. J. ROBBINS went to Mr. DAW's gardens near Kew Bridge to have the first choice of three stocks which had been raised by Mr. DAW from the same seed-head. They selected one which they named 'Daw's Champion.' The second choice was made by Messrs. SUTTON and named 'The Sutton.' The third was named 'Daw's Ruby' but I do not know who purchased it. My father took his stock to Marsh Farm, Twickenham, and propagated it as fast as he could. After a few years he had a sufficient stock to market and it was from his place that some of the Leeds growers had their first plantings. Mr. J. POUPART and Mr. ROBBINS did not take the same pains to increase their stock." The Journal of the Royal Agricultural Society for 1899 drew attention to the new variety which was being

raised at Twickenham, and to-day it is still one of the most popular Rhubarbs.

Shortly afterwards another variety appeared as 'Dawes' Champion.' This was raised by THEODORE DAWES at Syderstone, near King's Lynn. From correspondence between him and Mr. W. POUPART in 1900 it appears that this Rhubarb had been introduced some fifteen years previously and was a 'Victoria'-'Prince Albert' cross. It was used locally for forcing. This variety is not the widely grown 'Daw's Champion' of POUPART, although the latter is frequently incorrectly spelled with an "e."

'The Sutton' was first introduced into commerce in 1893. It is popular amongst some market growers for it forces well and is almost sterile.

After 'Daw's Champion' and 'The Sutton' the number of notable new introductions was very small. The best known are 'Dawes' Challenge,' 'Appleton's Forcing,' 'Appleton's Red,' 'Hancock's Crimson Grooveless,' 'The Streeter' and 'Glaskin's Perpetual.' 'Dawes' Challenge' was raised at Syderstone and is a vigorous Rhubarb of good rich colour and pink flesh. It received the **A.M.** in 1909. APPLETON'S two varieties were raised at Winnington Nurseries, Northwich. The "Forcing" received the **H.C.** in 1931, and is a seedling from 'Prince Albert' crossed with an early red believed to be 'Hawkes' Champagne.' The 'Red' was raised from 'Linnaeus' crossed with the same supposed 'Champagne,' and is practically sterile. It has a very deep stem colour but is a garden Rhubarb and does not force. 'Hancock's Giant Crimson Grooveless' was raised by T. HANCOCK, of Mansfield, and was derived from 'Champagne' crossed with a seedling selected for the grooveless character of the petiole. This variety is outstanding for its early maturity and thickness of leaf-stalk, and on these grounds its forcing capacities may be worth investigation. 'The Streeter' is an offspring of 'The Sutton' crossed with an old variety, 'Hobday's Giant,' and was originally raised by F. STREETER at Straffan House, Co. Kildare. It was also Highly Commended by the R.H.S. 'Glaskin's Perpetual,' raised in Brighton, was first listed in 1920 as a garden Rhubarb giving a generous supply of stalks throughout the year.

In 1928–29 a second trial of Rhubarb varieties was held at Wisley.[61] Of the forty stocks under observation, 'Hawkes' Champagne,' 'The Sutton' and 'Collis's Seedling,' a variety in the possession of the R.H.S., received the **A.M.** Those Highly Commended included the old variety 'Buck's Early Red,' 'Kelway's Crimson Queen,' 'Appleton's Forcing,' 'The Streeter' and 'Cutbush's Seedling.' The last was a Dutch seedling which appeared to be an improvement on the old varieties; it is now out of cultivation. A number of the varieties included in the trials had been in the possession of the R.H.S. for many years, having been moved from Chiswick, and many of them are no longer obtainable through the usual trade channels. Of the remainder, inquiry from the raisers elicits the information that, as

there is now very little demand for them, stocks have been allowed to dwindle until they, too, are practically unobtainable.

The introduction of new varieties and the increasing demand for forced Rhubarb brought a redistribution of the acreage under this crop. In the early years the London area was the source of all the supplies, both green and forced. From 1845, however, Manchester received regular consignments of green Rhubarb from Preston and Baguley, where OSBALDISTON grew 'Victoria' extensively,[62] but still depended upon the Home Counties for the forced product. In 1877 the first consignments of Rhubarb forced in the Leeds and Manchester districts reached the northern markets,[63] and the following year a certain amount was sent from there to Covent Garden. It is interesting to note that the bundles so consigned contained nine to twenty sticks packed alternately "head and tail." JOSEPH WHITWELL, of Kirkstall, near Leeds, was the largest grower of forced Rhubarb in the north at that time,[62] and largely through his efforts the West Riding became a serious competitor for the London growers. From the time of its entry into the market there was a slow but progressive decline in the acreage under Rhubarb in the Home Counties and a corresponding rise in the West Riding. By the end of the century Lancashire and Cheshire were also forcing Rhubarb in varying amounts, more especially on small holdings and farms from Old Trafford to Sale and through Baguley and Ashton-on-Mersey to Carrington Moss.[64]

The location of the crop in the highly industrial areas of the West Riding of Yorkshire has been attributed to several causes. It had its beginnings in the artisan gardens of the Hunslet district of Leeds, where it grew very successfully on land which had been spoilt for other crops. The plant flourished under the high rainfall of the district and on the light, acid, coal measure soils, and its large leaf surface and somewhat protected stomata withstood the smoke pollution. The latter, in fact, proved an advantage for it induced an early leaf fall, and the frosts of late September reduced the chances of second growth. Furthermore, under the more rigorous climatic conditions the dormancy period, essential for good forcing, was initiated at an earlier date than under the more open seasons of the London area. This enabled the West Riding growers to start forcing a little ahead of their southern competitors. Climatic and soil conditions cannot, however, be considered as being the only determining factors. Rhubarb growing, first started in the West Riding as a means to augment small incomes, has remained "in the family" for several generations, so that a very conservative industry has been developed. At the present time many of the growers are direct descendants and carefully treasure their particular methods of cultivation, which are handed on from father to son.

The industry has developed steadily until it now ranks, with Celery, as seventh in order of importance in England and, with Carrots, sixth in order of value. In 1937, 8,175 acres were under Rhubarb, and of these 3,819, *i.e.* 47 per cent., were located in the West Riding, where

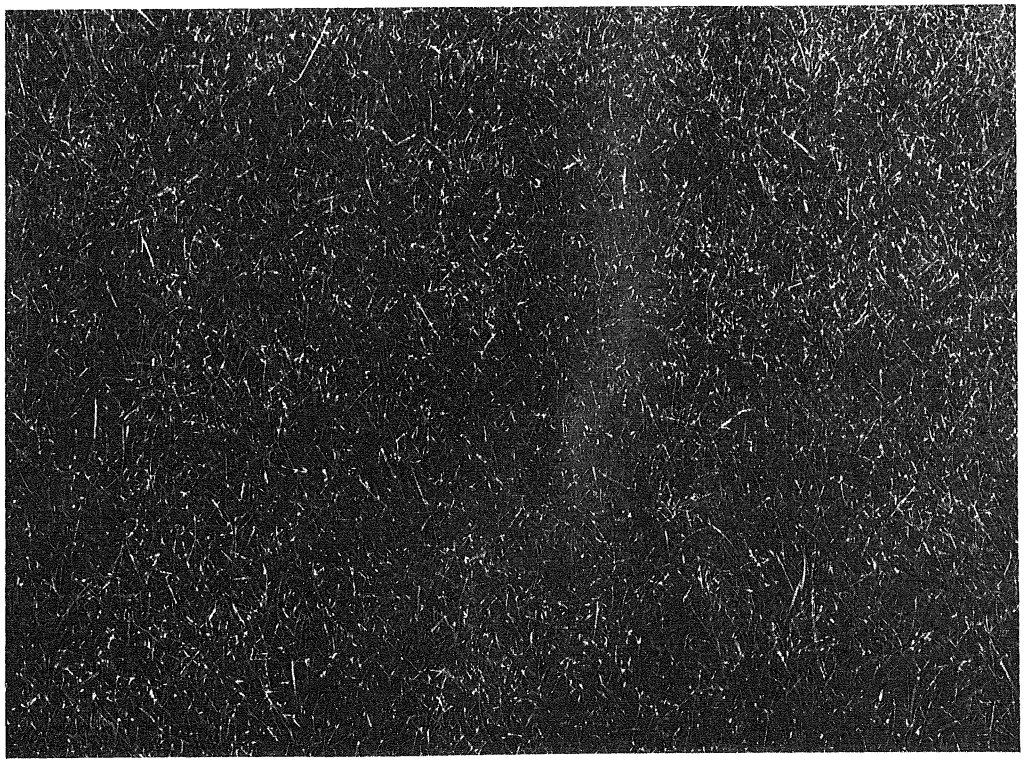


FIG. 87.—ESTABLISHED TURF OF CHEWING'S FESCUE.

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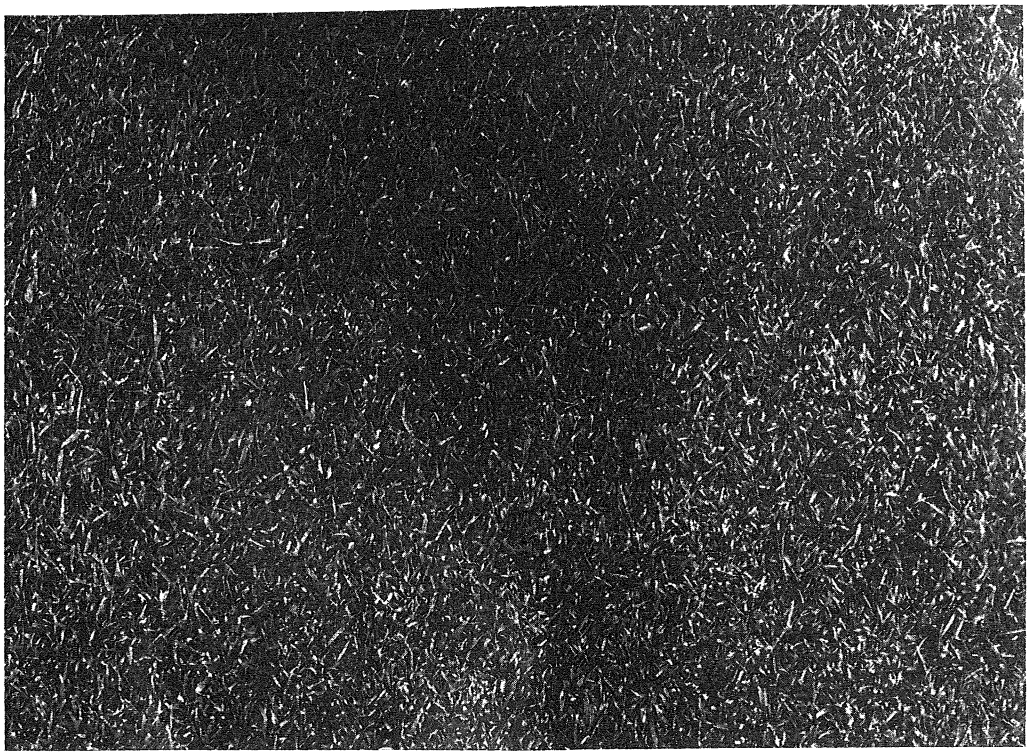


FIG. 88.—ESTABLISHED TURF OF NEW ZEALAND BROWNTOP GRASS.

the crop is distributed over an area approximately 18 miles square in the Aire and Calder valley. It forms roughly a rectangle extending from Leeds and Bradford to Meltham and Wakefield, the boundaries being limited by the coal measure soils, by the encroach of industrialism and by the high price of land. Elsewhere it is grown in Lancashire and Cheshire, in those districts of Kent, Essex, Middlesex and Surrey which are in easy reach of London, in the Vale of Evesham and locally near many of the large towns. The greater part of the crop is forced, for although there is a fair market for green Rhubarb, the early arrival of the soft fruits at once reduces the demand to a minimum. The chief varieties forced are 'Royal Albert,' 'Daw's Champion,' 'Victoria' and some 'Sutton' and 'Linnaeus'; these same varieties are also marketed green. Many growers, however, force their own selections of these varieties, claiming special marketable points for them. These selections have often been the property of a family for many years and roots are seldom obtainable in the open market.

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LAWNS.

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[Read March 8, 1938; Chairman, Prof. F. E. Weiss, M.A., F.L.S., F.R.S.]

When I was asked to deliver this Lecture before the Society I was in some difficulty as to what aspect of my particular work I should deal with. After due consideration I decided that I ought to discuss in general terms the more scientific aspects of the work in which I am engaged.

The investigational work under my charge is being carried out at a comparatively young experimental station in the North of England, at Bingley in the West Riding of Yorkshire. Since 1929 we have been engaged on plot and other experiments with turf-forming grasses, so that by now we have accumulated a good deal of new information on lawn matters.

It may be as well to explain that this Station is managed by the four National Golf Unions and the primary object is to investigate the scientific aspects of greenkeeping. Naturally, however, the bulk of our work can be applied equally well to lawns of all kinds. We have actually some 1,600 plots comprising different treatments or different sowings, from all of which valuable conclusions may be drawn on the general principles connected with lawn upkeep.

We are not the only Research Station concerned solely with turf matters, but we are the only one in Great Britain. There is a similar organization in the United States, and in 1932 a Board of Greenkeeping Research was started in New Zealand. More recently some of the States of Australia have started experimental work, and in South Africa there is also much activity; in fact, there has been so much activity in lawn matters that the literature on the subject is becoming quite extensive. It is significant that wherever research stations are working on greenkeeping matters their inception is due to the enthusiasm of golfers.

Before going on to a consideration of some of the experimental work we may examine what should constitute an ideal lawn.

First of all, an ideal lawn should be free from weeds; then, it should be uniform as regards colour and trueness, and there should be a dense cover with a good rich colour throughout the season. Furthermore, worms should not exist, and the grasses composing the sward should be the dwarf types. If composed of several species they should be intimately mixed. Not only should a lawn bear close examination, but it should look well from a distance and, if it is an ornamental sward, bear a relationship to the surroundings. Another important point

about the garden lawn is that it should be drought-resistant and should have a carpet-like feel when walked upon.

The attainment of these attributes is an exceedingly difficult matter. The conditions are very exacting and the fact that the grasses are constantly being mown tends to limit the flora both as regards the grasses and the non-grasses. We do not require in our lawns a big bulk of herbage, what we want is density with minimum growth so that we may avoid excessive mowing. Mowing, as I have said, limits the species which will grow in a lawn and the finest turf is usually composed of the Bent and Fescue grasses (genera Agrostis and Festuca). Many lawns contain a large percentage of annual meadow-grass, and if properly managed this species makes a reasonably good cover, although for a fine putting green it is not wholly satisfactory. It is a fact that mowing limits the grass species in a lawn; and it also limits the weed flora. Creeping weeds like yarrow, clover, mouse-ear chickweed, pearlwort, and the flat weeds like plantain, daisy, cat's-ear and dandelion are all able to tolerate the intensive defoliation which is imposed on the turf.

Why are so many lawns found to be in a bad condition? I think the causes must be sought in neglect and, above all, a failure to appreciate the fact that lawn maintenance is an intensive process. A great deal of hard work must be put in to get the best results and many lawns are sadly abused as regards mowing, rolling and other essential operations. It is no uncommon experience to find a garden with a beautiful display of bedding and herbaceous plants and yet the garden lawn is mainly composed of weed; unfortunately lawn owners fail to realize that the lawn must receive as much, or perhaps more attention than the flowers if success is to be achieved.

Last year I had the pleasure of showing a well-known visitor from Australia, who was interested in turf, a number of famous golf courses and large lawns. What impressed my friend most was the lack of uniformity shown in our turf. Apparently in Australia a one-grass lawn or one-grass green is required and the mixture of strains and species which we have in this country would not be tolerated. That is rather illuminating, because we have been taught in this country that to be successful a lawn should be composed of a number of species.

Our experiments and experience go to show that excellent results can be obtained with one species or with two species if they are compatible. The proof can be found in certain experiments put down in 1929. We sowed down ten large plots of turf consisting of Chewing's fescue, New Zealand browntop, hard fescue, fine-leaved fescue, creeping red fescue, German bent, and two of the Poas, and two plots of mixtures of two species (bent and fescue). These plots are now nearly nine years old and have been continuously mown, dressed, and treated in other ways since that time. Of the turf areas concerned, one can eliminate right away the pure sowings of smooth-stalked meadow-grass and rough-stalked meadow-grass, the red fescue and the hard fescue. When sown alone they do not make a dense

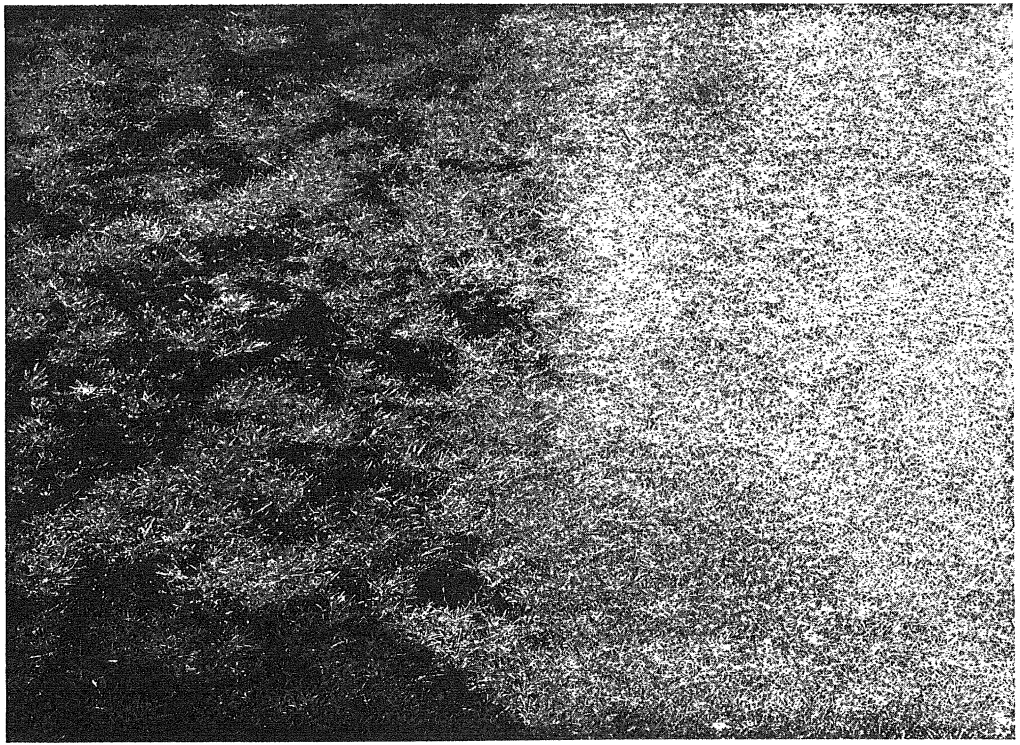


FIG. 89.—EXPERIMENTAL PLOTS OF CHEWING'S FESCUE.
Plot on left unmanured since 1929, on right dressed regularly with fertilizer.

[*To face p.* 372.

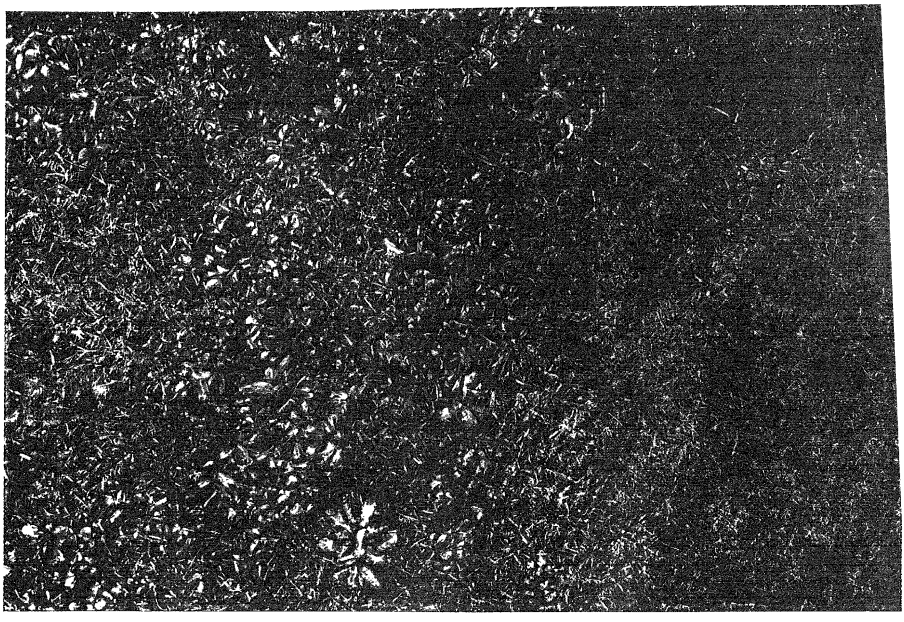


FIG. 90.—ON LEFT, UNTREATED TURF. ON RIGHT, WEEDS ERADICATED BY TREATMENT WITH SULPHATE OF AMMONIA AND SULPHATE OF IRON.

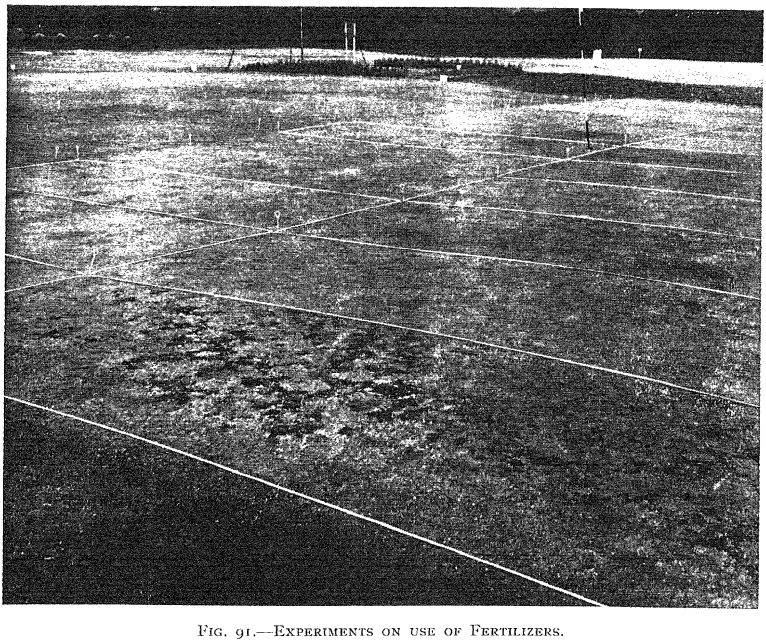


FIG. 91.—EXPERIMENTS ON USE OF FERTILIZERS.
The plot in front untreated is invaded by moss.

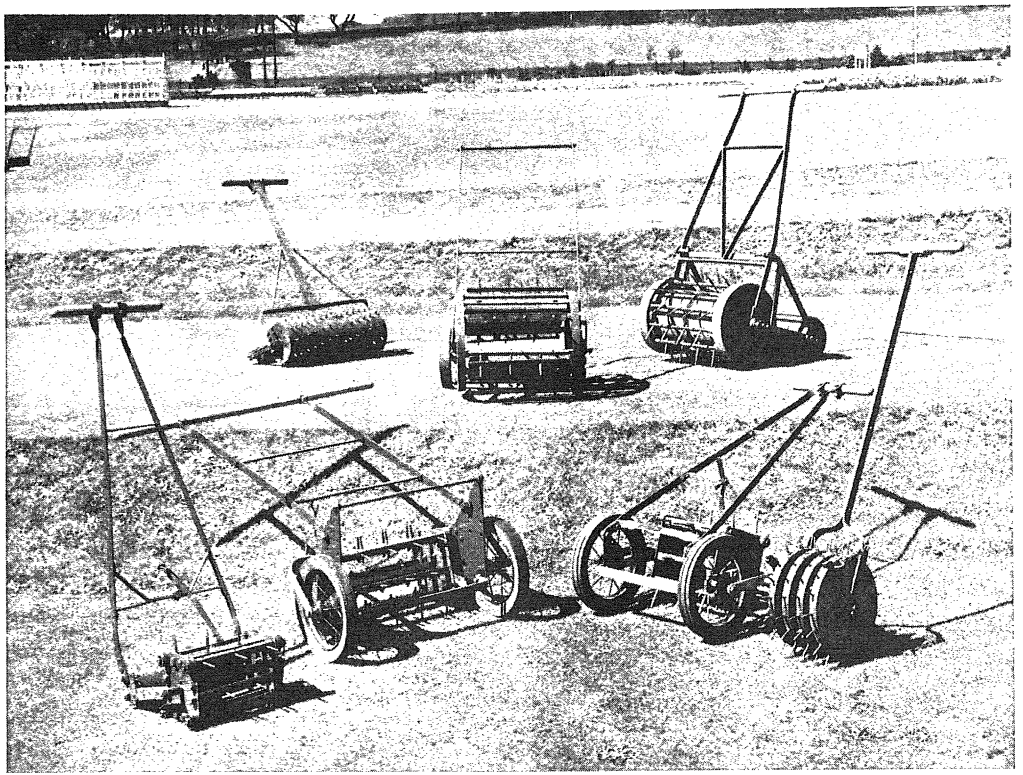


FIG. 92.—MODERN PRICKING AND SPIKING MACHINES FOR LAWNS.

[*To face p.* 373.

turf. Chewing's fescue (fig. 87, 89), New Zealand browntop (fig. 88), fine-leaved fescue and German bent all make excellent turf when sown alone and when adequately fertilized. The simple mixtures of two species also proved satisfactory.

Other experiments have been concerned with sowings containing dog's-tail and perennial rye-grass, a species commonly included in the cheaper mixtures of grass seeds. Unfortunately, these mixtures do not survive the intensive mowing which a good lawn should receive, becoming gradually thinner and allowing the entry of weeds. In establishing a lawn from seed it is most important to use pure seed. Even the presence of 0·1 per cent. of an injurious weed may result in a great deal of difficulty and expense after the grass seed has germinated. It is no less important to sow on clean land. Rye-grass mixtures rarely give a permanent turf.

Turf production by sodding is commonly employed by the small lawn owner. Often the turf is very unsuitable as regards species and uniformity. Recent experiments indicate that better establishment of turf results when it is cut thinly.

One line of work which we are carrying out at Bingley is in connexion with the selection of better strains of grasses in the two families, fescue and bent. Most of you are aware of the variations which are found in garden plants; the grasses are subject to very similar variations as regards leafiness, density, and general turf-forming capacity, and we are endeavouring to select from these variations those types which will make the best turf. For example, *Agrostis tenuis* Sibth., or browntop, is very variable, and taking a lawn of an indigenous leafy strain over a twelvemonth period, it will be found to be much denser and greener turf than a corresponding lawn made from imported browntop from New Zealand (fig. 88). Therefore the aim is to increase the stock of such selected types, a project which is no easy matter. Latterly an improved strain of fescue—St. Ives creeping red fescue—has been grown commercially and is available for distribution.

I wish at this point to say something about weed control. I have already mentioned some of the reasons why weeds are often so prolific in lawns. By their prostrate habit they are able to escape the cutting action of the mower, and the gradual elimination of the competition of the grasses leads first to their entry and then to their increase.

For convenience the weeds may be grouped into three sections—namely, (1) the mat weeds, such as pearlwort, mouse-ear chickweed, self-heal and yarrow; (2) the flat weeds, including all the plantains, daisy, cat's-ear and the dandelion; and (3) the clovers. Methods of eradication can be related to the type of weed, but actually in practice most weedy lawns contain weeds in all three groups, and some method of treatment which will deal with them all has obviously got to be devised. Perhaps the commonest method of weed control adopted hitherto has been by means of lawn sands, which are commodities of varying composition containing materials like sulphate of ammonia, sulphate of iron and sand—sometimes rather a lot of sand! These mixtures

are usually rather drastic, and whilst they will destroy the weeds are liable to leave a great deal of bare ground. We have found that it is better to reduce the weeds by a process of gradual elimination. We find that a mixture composed of three parts by weight sulphate of ammonia and one of calcined sulphate of iron with twenty parts of a carrier applied six times a year at four ounces to the square yard will eliminate the majority of the common weeds (fig. 90). It may be necessary to apply a heavier local dressing to some of the more resistant weeds, but this mixture, if used carefully, will bring on the finer grasses, if present, to a remarkable extent and gradually reduce the weed flora. The distribution of this mixture can be effected either by hand or by a mechanical distributor.

Where there is a great deal of mouse-ear chickweed or pearlwort, both weeds being rather resistant to the above treatment, the amount of sulphate of iron may be increased, and some of our experiments have shown that the proportions I have given above may be reversed to advantage so that more sulphate of iron than sulphate of ammonia is used. Where such a mixture is used the amount of growth which follows the treatment is considerably less and the amount of blackening from the sulphate of iron definitely greater.

Other experiments have shown that sulphate of iron given alone will control the majority of weeds, provided it is given heavily enough or frequently enough. This method has the advantage that it does not force the growth of grass unduly as happens when the large amount of nitrogen in the sulphate of ammonia is given.

Other ammonium compounds are also effective in eliminating weeds, namely ammonium phosphate and ammonium chloride, but the one usually employed is sulphate of ammonia.

The reasons for the elimination of weeds by these treatments is not really part of this lecture, but, briefly, control may be attributed to the increased competition from the grass following the dose of nitrogen, the increased acidity which often takes place, the release of ammonium-ions in the soil which are more toxic to the weeds than the grasses, and, lastly, by direct plasmolysis.

Regular lime dressings favour weed invasion, so that, as a general rule, lime should be withheld or used only very sparingly as a corrective to excessive soil acidity. The variation in conditions prevents a definite recommendation as to rate.

Many lawn owners rely too much on chemical methods of weed control, forgetting the value of the rake. For creeping weeds this tool is very valuable, and I have often virtually eliminated clover by systematic raking to pull out the runners prior to mowing. Close scything, or shaving by various implements made for the purpose, also proves very valuable in coping with weeds. The process removes the leaves, gradually weakening the weed, and enables the grass to assert itself more vigorously. Some hand weeding is nearly always necessary, especially for tap-rooted weeds, even though chemical and mechanical methods of control have been adopted.

A very difficult weed to control in lawns is Yorkshire fog, and there is no really satisfactory chemical method. The present methods consist of severe raking and slashing with a sharp knife followed by reseeding to establish the desirable grasses in the place of the weed.

Another method of weed eradication, which is hardly adaptable for small lawns but applicable to large areas, is to spray with dilute arsenic acid. It is a method very successfully employed in New Zealand.

It is appropriate to refer at this stage to moss control, which subject you will remember received some attention in the JOURNAL of the Society in September 1936. The usual method of controlling moss in lawns is by means of applications of sulphate of iron or compounds containing it, followed by a general fertilizer to increase the fertility of the soil. Moss is more usually associated with low fertility than with excessive moisture (fig. 91). Most people are inclined to associate moss with water-logged conditions or a bad drainage system. Very often it is associated with a spongy "fluffy" turf and can be very largely reduced by suitable consolidation. Spiking, by improving fertility, also helps to reduce moss invasion (fig. 92). In the paper in the Society's JOURNAL referred to, potassium permanganate was advocated for the purpose of moss control. About twelve months ago we put down some experiments to try out this material quantitatively on a carefully controlled group of plots. There were some five mosses present, three being common, namely:

Ceratodon purpureus Brid.
Hypnum cupressiforme Hedw.
Polytrichum juniperinum Willd.

The soil was very low in fertility and botanical analyses were kept to show any changes which might take place in the flora on the plots. It was found that the lower rates of application were unsuccessful in bringing about any marked control. The higher rates, however, namely 2 and 4 oz. to 3 sq. yards of turf, given in solution, and the 1 oz. dressing given in dry form, produced a marked reduction of the moss. Unfortunately it was found on the onset of autumn that this reduction was largely temporary and that re-invasion was taking place. There had been during the season a marked reduction of the moss even on the control plots. The conclusion may be made that permanganate of potash has a purely temporary action on moss. In the paper in the R.H.S. JOURNAL referred to above it is recorded that permanganate of potash induces a dark green colour in the grass. On our experiments we never saw any change in the colour of the grass on the plots, except an immediate dying of the foliage, and whilst harmless to the grass it was certainly not observed to be specially beneficial (fig. 93). Further experiments are being carried out to investigate the use of permanganate of potash, because in all probability a combination of this treatment with fertilizer treatment may lead to interesting results. One of the difficulties in making an experiment of this type is that of distinguishing dead and living moss, but I think one may conclude from

the experiments so far as they have gone that the moss reduction by permanganate of potash is very largely temporary.

The earthworm is perhaps the commonest pest of fine turf and I wish now to speak about control and eradication. There are quite a number of well-known methods: solutions of perchloride of mercury, 1 in 2,500, copper sulphate, 1 in 500 and permanganate of potash, 1 in 300. Then Mowrah meal applied to the surface in dry form and watered in is a safe and popular material, while lead arsenate, a comparative newcomer, may be used at 2 oz. to the square yard. There is very little quantitative information about the relative merits of these methods, but we are conducting experiments to obtain data.

Perhaps I might mention one experiment in which permanganate of potash was compared quantitatively with Mowrah meal as the standard. Two full-scale experiments were laid down last year with suitable replications, and it was found that permanganate used at ½ oz. to the square yard dissolved in a gallon of water, was the lowest effective rate and gave results equivalent to Mowrah meal used at 6 oz. to the square yard; the relative cost was about the same. There was no sign afterwards of any stimulation of the growth of the grass following the permanganate as was the case with the Mowrah meal.

In 1930 a series of worm-ridden turf plots was dressed with lead arsenate powder with a view to testing it for controlling earthworms and seeing what effect it had on the grass. It was found that after a few months 90 per cent. control was obtained at the 2 oz. rate, while no harm resulted to the herbage. The difficulty, of course, in this experiment was to assess the results, since the worms die underground, and as distinct from other methods in which the worms come to the surface there is no yield to obtain for purposes of comparison. Therefore, it was necessary to assess the value of the lead arsenate by the number of casts which were subsequently formed. This is not wholly satisfactory, because even should a few casts be formed their size is very much less than where the lead arsenate has not been applied. Whilst evidence points to the earthworms being killed by the treatment, there have been instances where some worms have survived but have been deterred from reaching the surface to form their casts. The lead arsenate treatment at 2 oz. to the square yard costs, including the labour for application, about £15 an acre, whereas with Mowrah meal, including the labour and cost of the water, it would be about £8 3*s*. 6*d*. In first cost therefore, the Mowrah meal is less expensive, but it must be realized that the lead arsenate will last perhaps 4 years, whereas the Mowrah meal will rarely last beyond 2 years. The period and degree of control varies according to the nature of the soil, and only a very generalized statement can be made. Lead arsenate, though almost insoluble in water, is poisonous and domestic animals or stock should be kept off the treated turf until the powder is washed by rain into the soil.

There is another aspect of the earthworm problem to which reference must now be made and that is earthworm inhibition. Starting

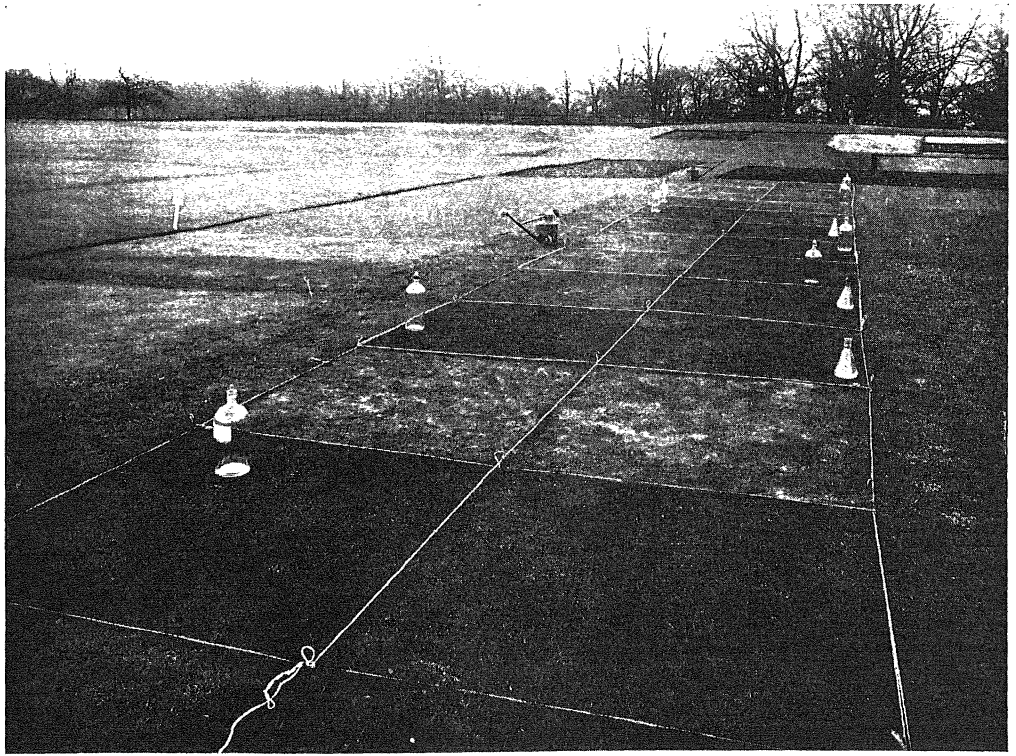


FIG. 93.—EXPERIMENTS ON CONTROL OF MOSS BY MEANS OF PERMANGANATE OF POTASH. THE DARKER PLOTS RECEIVED STRONG SOLUTION.

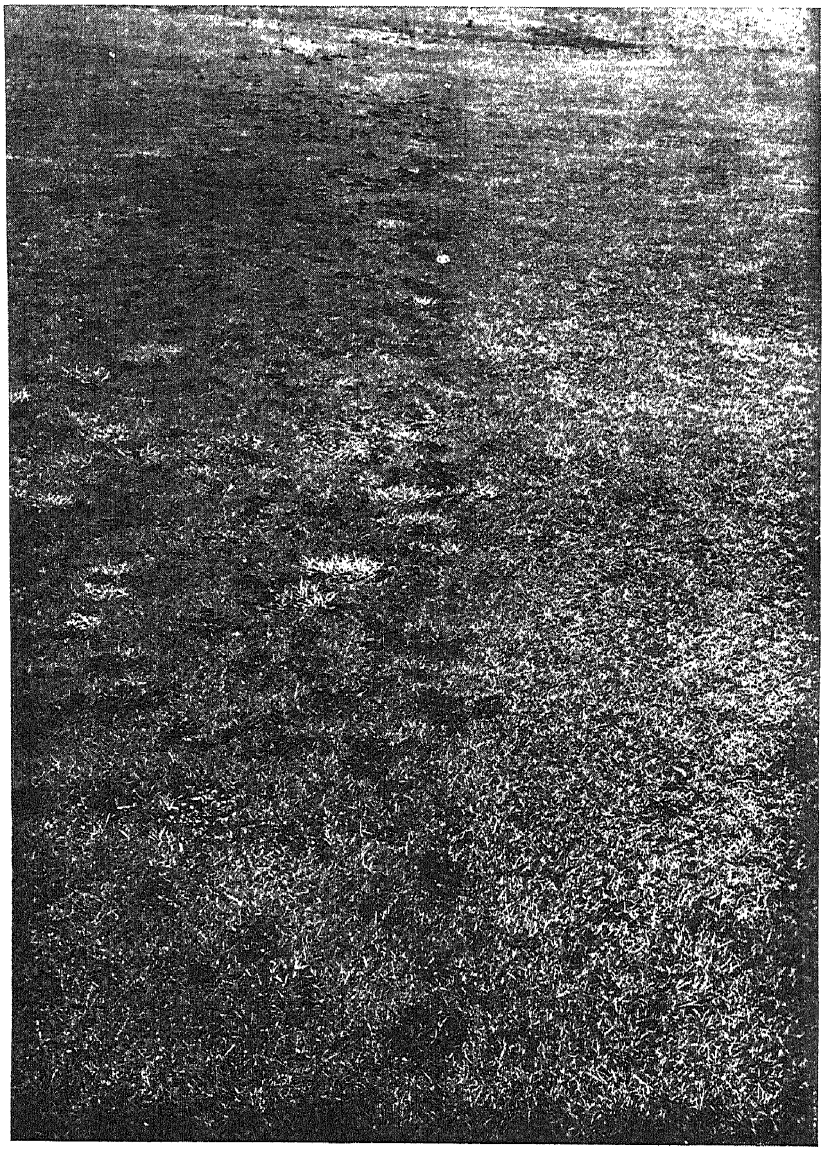


FIG. 94.—EARTHWORM INVASION.

The turf on left received regular dressings of Nitro-chalk, and is invaded by earthworms. The turf on right received dressings of Sulphate of Ammonia containing equivalent nitrogen and is almost free.

[*To face p.* 377.

with a worm-free turf, it is possible either to keep it reasonably worm-free or to encourage the earthworms to re-invade it. Quite a number of factors are responsible. For example, the height of mowing, strange to say, has an effect on earthworm activity. Where turf was cut at the height of $\frac{3}{8}$ inch there were on the average 15 worm casts to the square yard; where we mowed at $\frac{1}{4}$ inch there were about 12 to the square yard, and where the blade was lower still ($\frac{1}{8}$ inch) there were only an average of five casts to the square yard. Removing or returning the cuttings also has an effect. For example, where we returned the cuttings every time mowing was carried out, there were on the average 14 casts to the square yard, while on an equivalent plot where the cuttings were always removed 6 worm casts to the square yard was the average number. This shows that the return of the cuttings favoured earthworm invasion.

Most people who have good lawns apply each year various forms of top dressing, and on one group of experimental plots dressings of inland sand were applied, whilst on another sea-sand was used. It was found that after about three years earthworms invaded both areas of turf, but there were 7 to the square yard where sea-sand had been given against 3 to 5 to the square yard where inland sand had been given. The sea-sand had favoured the re-invasion of the earth worms. In all probability this is due to the presence of a small percentage of lime in the form of shell in the sand.

Then the fertilizer treatment given the turf may favour or discourage earthworm invasion. Thus on some plots where sulphate of ammonia had been given three times a year for five years to worm-free turf there were no worm casts at all, whereas where nitro-chalk had been given (at an equivalent rate of nitrogen) from 11 to 20 worm casts were found on each square yard. There was some variation from plot to plot, that is why the two figures are given. Sulphate of ammonia either alone or with sulphate of iron keeps out the earthworm, whilst dressings of lime, say in the winter months, will favour invasion (fig. 94). On a certain plot given winter dressings of lime anything from 16 to 35 casts to the square yard was common. Sulphate of iron alone will reduce earthworm activity, and on a turf containing earthworms the number of casts after treatment fell from something like 20, to 1 to the square yard; they can also be largely reduced by regular dressings of sulphate of ammonia and sulphate of iron. On one plot the number of casts was found to be 3, whereas on the untreated it was in the thirties.

I now pass to a brief reference to leather-jackets, because many of you may have had difficulties with these in the last few years, at any rate a large number of sports grounds have suffered severely. As is generally well known the leather-jacket is the grub of the daddy-longlegs fly. The grub feeds during the winter months upon the roots of the grasses, gradually destroying them. Egg-laying usually takes place in the first week in September; the female fly laying from 250 to 350 eggs, which hatch in 12 to 14 days into baby leather-jackets

about ⅛ inch long. Dry weather conditions at this stage cause a heavy mortality whilst if the weather is mild and moist the grubs immediately begin to thrive. Thus, the conditions at this time of year largely determine whether or not there will be serious damage the following spring and early summer. Efforts have been made for years to find some satisfactory method of eradicating leather-jackets, and many experiments have been conducted at St. Ives. For instance a light-trap has often been thought feasible, but unfortunately it was found that the females caught in the trap had already discharged their load of eggs, thus showing this method to be useless. No satisfactory method is known for making the turf distasteful to the laying female. Carefully controlled experiments were made with lead arsenate at different rates and in two forms and this material was found to be effective. One dressing of 1 oz. to the square yard was sufficient, when the grubs were comparatively small, to give from 90 to 98 per cent. control. The disadvantage is the cost of the lead arsenate. A method devised at the St. Ives Research Station and found to be very safe and effective involves an application of an emulsion of Jeyes' fluid and orthodichlorobenzene diluted 1 : 400 with water. This treatment brings the grubs to the surface where they lie anæsthetized. In this condition they can be very easily swept up, as on reviving they would return below the surface. The treatment is best done when the grubs are half-grown. Many acres of turf have been saved by this method. A special assistant is at present working at St. Ives on problems concerning the habits and life history of leather-jackets.

I must now pass on to a consideration of mowing in relation to lawns, because mowing is so frequently neglected. Most of us I suppose like to mow the lawn as little as possible, and perhaps select Saturday afternoon or even Sunday morning for that purpose, but it is quite wrong if you wish to get the best results to mow by the day of the week; mowing should be done regularly. To get the best results you should mow fairly frequently, twice or even three times a week, but only low enough to remove the tops of the grass blades. I make that statement because of certain trials on mowing which we have made in recent years; it was found that cutting three times a week actually removed less weight of clippings than mowing once a week, and analysis of those clippings shows a lower withdrawal of soil nutrients by the three cuttings than by the one single cutting. Based on our results the proportion can be stated like this: if you cut once a week and the yield is 100 lb. of grass then mowing three times a week will give a yield of about 86 lb. Similar experiments have been done on intensity of mowing which is another aspect of the same problem; regular mowing at ⅛ inch will remove much more material and do much more defoliation or damage to the grass than where cutting is at ⅜ inch.

In recent years a great deal of interest has centred round the aeration of turf. This may be carried out by various types of hand fork or by the pricking or spiking machines (fig. 92) now on the market.

Among these there is the well-known type consisting of a wooden roller studded with sharp spikes about an inch long, and if used regularly this prevents surface sealing and assists the penetration of moisture; it also helps to aerate the mat which tends to form upon the surface of the sward. For deeper spiking it is necessary either to use hand forks or one of the machines which have come out lately for the purpose. Deep spiking will relieve compression, aid water penetration and in periods of drought, perhaps due to the increased root development, give greater resistance to water shortage. Thus, on a forked plot during one dry spell the moisture content of the soil was 19 per cent. whilst on the unforked counterpart it was only 9 per cent. The tubular method of forking has been much advocated and forms a very valuable method of assisting root development and water entry (fig. 95). It is normally a winter operation. In many cases spiking and forking have helped to reduce moss.

I have already mentioned that most people with good lawns adopt a system of top dressing; they apply a general fertilizer occasionally, with a carrier of some type of compost material consisting of rotted manure, soil and sand. This ensures a true surface, and if the surface is true mowing is more accurate and rolling need never be heavy or frequent. Annual dressings of sand are very valuable top dressings if given in the autumn before growth finally ceases, and on very wet land charcoal is a popular material.

Most lawn owners believe that turf can only be produced from seed or from sods, but there is a third way, namely, by a system of vegetative propagation. This method of turf formation is the usual one adopted in tropical countries, and has been very extensively used in the United States. I only know of two instances where vegetative propagation has been done on a large scale in this country, namely at two golf clubs, St. George's Hill and Wentworth, where a number of greens were made in this manner. Recently, however, other golf clubs in this country and a few private lawn owners have tried the method of forming turf vegetatively from creeping grasses. One of the most suitable species for this purpose is Velvet Bent (*Agrostis canina*) (fig. 96). It is suitable for two reasons: first, because it is fine-leaved, dense and with a good colour, and, secondly, because it produces extensive runners. There is no satisfactory commercial supply of the seed. Briefly the method is to plant out small plants or shoots (tillers) of the grass two or three feet apart in the spring, and runners are produced by early September. These are removed from the plants in autumn, cut into short lengths and scattered on the surface of the prepared soil, lightly topped with soil, rolled and kept watered. By July the following year a good turf will gradually be produced.

In concluding this paper I must make a brief reference to turf diseases. Intensity of lawn management has undoubtedly increased in the last few years and, as a result, lawns appear to be more susceptible to disease. Perhaps the commonest complaint is caused by *Fusarium nivale* which attacks the turf, generally in the autumn,

leaving circular patches of dead or semi-dead grass. The disease is now known as Fusarium Patch Disease (fig. 98). Control can be effected by means either of perchloride of mercury or a dye known as malachite green. Another species of fungus, Corticium, is sometimes found on turf, though generally on untreated areas. It appears as small reddish coral growths which are most noticeable about the end of August or early September. Similar treatments can be adopted.

Another recent complaint has been dollar spot, a species very usual in the United States and very difficult to control. The usual method advised in the States is calomel applied in the dry form with a carrier of sand.

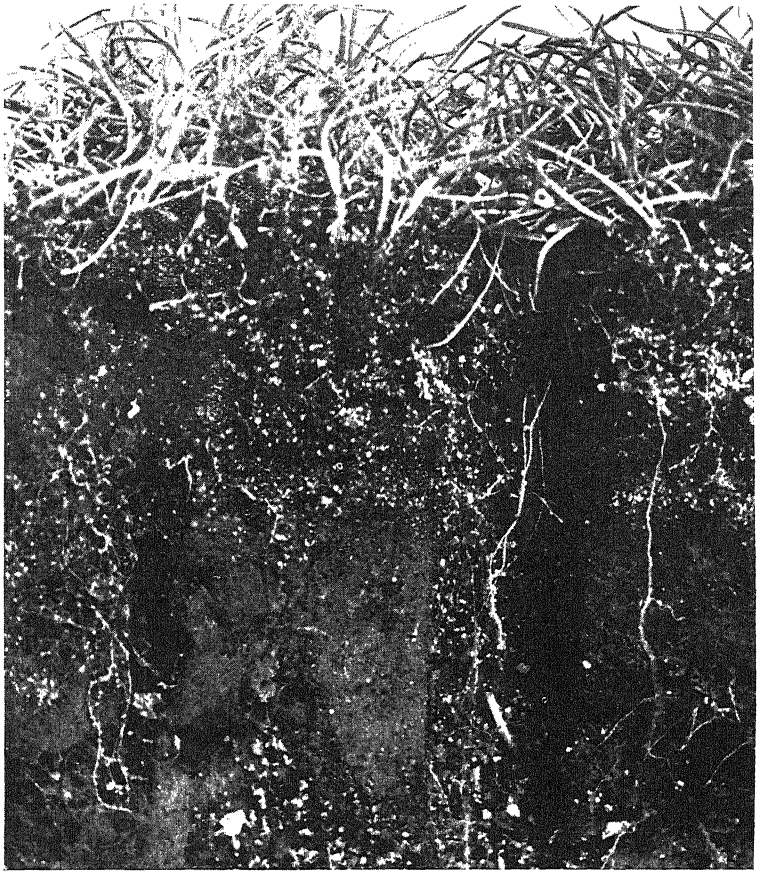


FIG. 95.—SECTION OF TURF SHOWING ROOT DEVELOPMENT IN HOLES MADE BY TUBULAR FORK.

[*To face p.* 380.

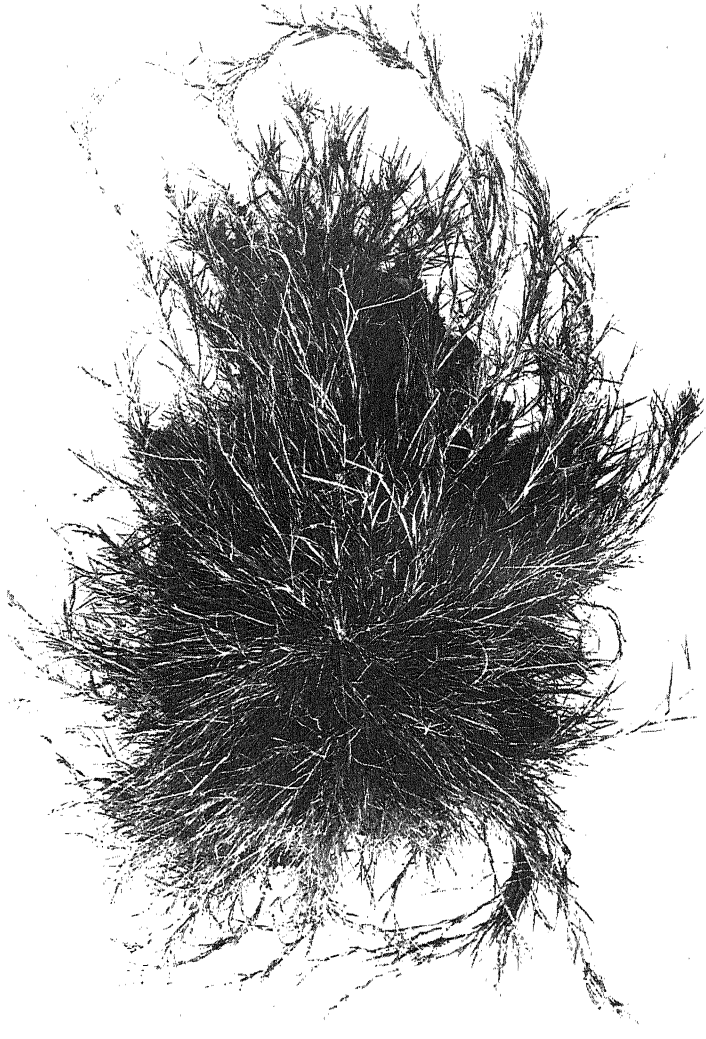


FIG. 96.—A SINGLE PLANT OF VELVET BENT (*Agrostis canina*) SHOWING EXTENSION STOLON FORMATION.

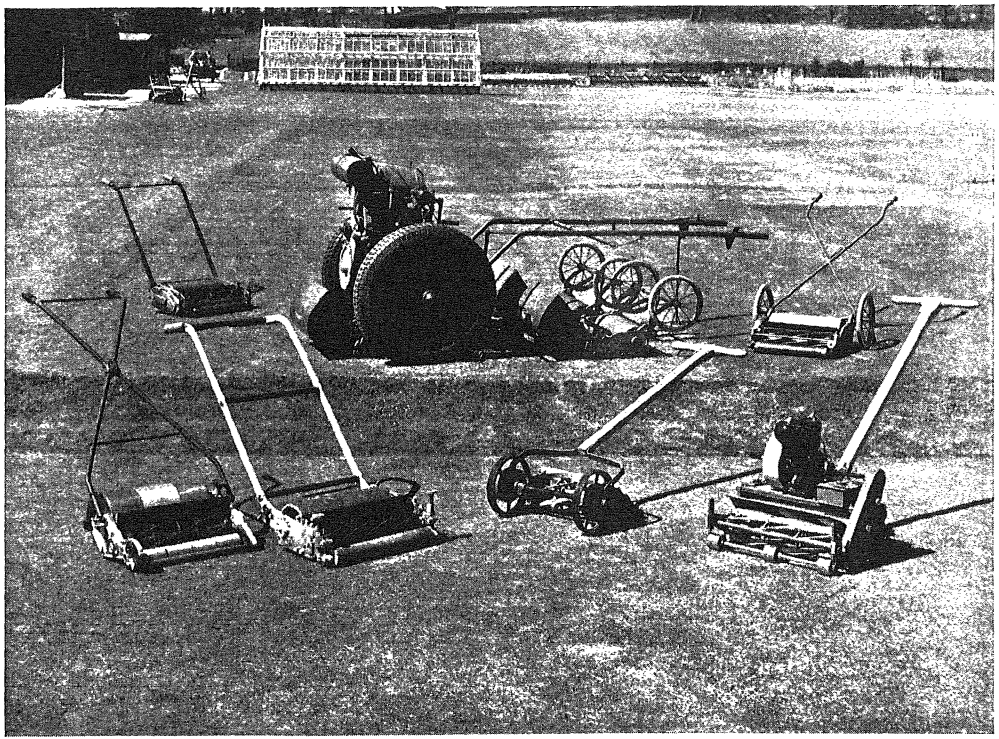


FIG. 97.—MODERN TYPES OF MOWING MACHINES FOR LAWNS.

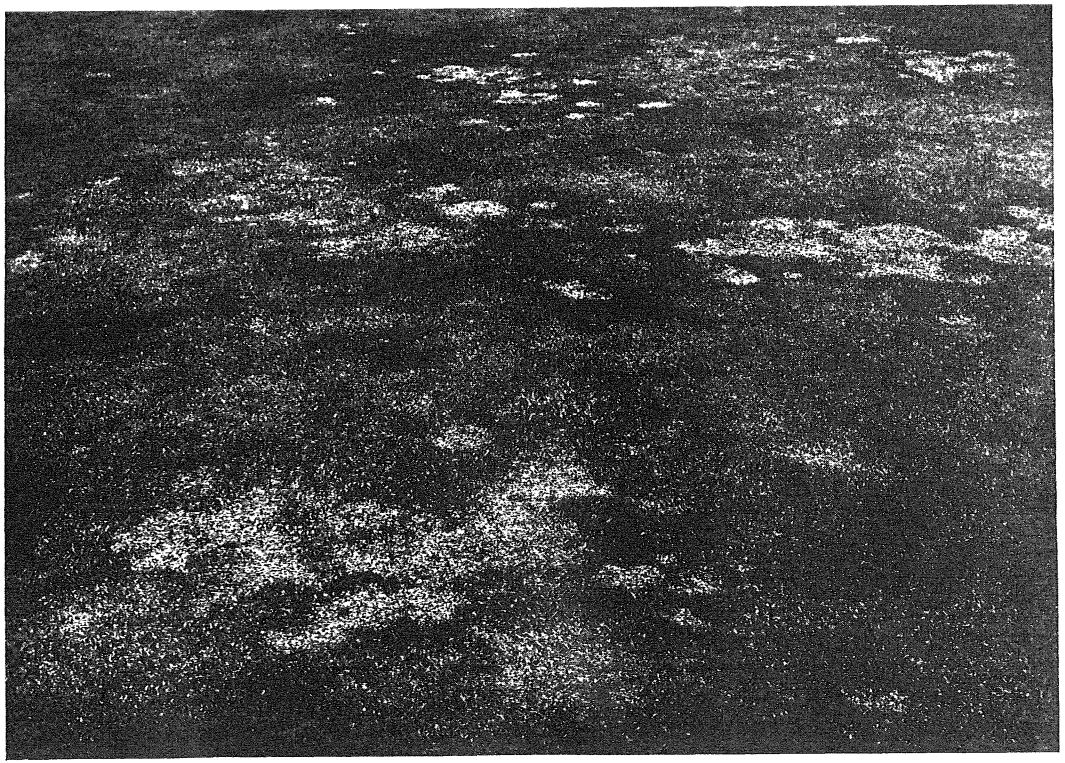


FIG. 98.—FUSARIUM PATCH DISEASE OF LAWNS.

[*To face p.* 381.

RECENT PROGRESS IN BOTANICAL EXPLORATION IN CHINA.

By Prof. H. H. Hu.

[Read by Prof. Sir W. Wright Smith, F.R.S.E., V.M.H., on April 5, 1938.]

It is well known that in 1879 when Charles Maries was sent to conduct an expedition of botanical exploration in China, his journey up the River Yangtze stopped at Ichang. His botanical harvest was quite meagre in contrast with his expectations. He was thus led to believe that the flora of China is not at all rich, and that there was little to expect in future botanical exploration in China. Yet if he had gone up a few days' journey from Ichang, his fortune would have been entirely different. It was not until after 1885, when Prof. Augustine Henry made his highly successful contributions, that the richness of the flora of Central and Western China became universally acknowledged. Before and after him Père David, Père Delavay and Père Farges also made large collections in Szechwan and Yunnan. Later, Dr. Ernest H. Wilson's botanical exploration in Szechwan and Eastern Tibet on behalf of Veitch and Sons and the Arnold Arboretum of Harvard University, and George Forrest's many years of exploration in South-Western Yunnan reached the zenith of achievement in botanical discoveries by western botanists in Western China. Farrer, Kingdon Ward, Joseph Rock and Handel-Mazzetti are their able successors. Their work was all concentrated in Western China, and it seemed that little was left to be done after their strenuous efforts of the past years. A vague belief seems to exist among western botanists that there is little to be expected in botanical exploration in South-Eastern China, and that the botanical wealth of Southern China has already been exhausted by earlier botanical collections. It is left to Chinese botanists to make fresh contributions from these regions and the malaria-ridden tropical jungles of Southern Yunnan.

Before 1920 little had been contributed by Chinese botanists to botanical exploration of China. Prof. K. K. Tsoong, an energetic old-fashioned herbalist type of botanist, had made several exploratory trips in Kwangtung and Yunnan provinces, though no notable contributions have been made by him. The genus Tsoongia of Verbenaceae is, however, named in his honour. The writer may be said to be the first modern-educated Chinese botanist who has conducted an extensive botanical exploration in any part of China. As already mentioned there is a vague though erroneous belief among western botanists that there is little to be expected in botanical exploration in South-Eastern China, hence the concentrated effort in exploring repeatedly in Western China. Yet it seemed to the writer that this could not be the truth.

Therefore in 1920 he started to explore the interior of the provinces of Chekiang and Kiangsi. In a hurried trip of reconnaissance the exploration was far from exhaustive. Furthermore, his entire collections made in these two provinces were unfortunately completely destroyed by fire when the Science Buildings of the National South-Eastern University were burned down in 1923. But from these collections a number of new species have been discovered and published, not the least interesting of which is *Tashiroea sinensis* Diels of Melastomaceae, a member of a genus hitherto known to be endemic only in Japan. In 1921 the writer discovered the interesting water-pine, *Glyptostrobus pensilis*, which was hitherto known only as a swamp-dwelling shrubby tree common around Canton, growing to a height of 50 feet in the mountains on the border of North-Eastern Kiangsi and Fukien provinces, a region situated at a latitude several degrees north of Canton where the tree thrives. It is so common there that sprays of fruiting branches of this conifer are used to decorate the bride's dowry as a symbol of prolificity, on account of the large quantity of fruits produced. The seeds of this local strain of this beautiful tree should be introduced into England as it will probably prove to be hardy enough for the climate of Southern England.

In 1924 Prof. R. C. CHING, the noted pteridologist, at that time my assistant and now the Keeper of the Lushan Arboretum and Botanical Garden of the Fan Memorial Institute of Biology, explored Southern Chekiang and Southern Anwhei, and made many important new discoveries. The long-leaved *Torreya Jackii* Chun, a species related to the Californian *T. californica*, discovered on the border district, Tai-shun in Southern Chekiang, is one of the most interesting of his finds. *Halesia Macgregori* Chun, a new species of a genus hitherto known as endemic only in North America, is another. This tree was later discovered also in Kwangtung. A beautiful new species of another American genus, Zephyranthes, *Zephyranthes Tsouii* Hu, was discovered by him in Southern Chekiang. This plant has a rosy flower 7·5 cm. long on a scape up to 24 cm. long. It has never been introduced into cultivation in European or American countries. Such a gem should not be neglected, though it may not be hardy in out-door cultivation in this country. Among his interesting new discoveries made in Southern Anwhei must first be mentioned the new monotypic genus Monimopetalum with the species *Monimopetalum chinense* Rehder of Celastraceae. This interesting vine has not yet been introduced into cultivation. Neither has the interesting *Cercis Chingii* Chun, which may not be a Cercis at all as the legume is dehiscent. A gigantic variety of *Torreya grandis* Fort. var. *Sargentii* Hu, with large and palatable nuts which had been sent as a special local tribute to the first Emperor of the Ming dynasty nearly six centuries ago, was also discovered by him. This tree should be introduced into Southern England, as well as several other varieties which yield edible nuts which are regularly on sale in the market of Hangchow city, the capital of Chekiang province. *Magnolia cylindrica* E. H. Wils. is also a new species discovered by him.

In the winter of 1925 Prof. R. C. CHING first collected in the suburb of Nanking fruiting specimens of a small tree of Styracaceae. In the spring of 1926 the writer told his assistant, at that time Dr. Y. L. KENG, to collect flowering specimens of this tree which proved to represent a new genus. This small tree, *Sinojackia xylocarpa* Hu, is heavily laden with numerous pendulous white flowers which are very handsome. After the first batch of fruits was collected it was learned that this type-tree had been cut down during road-making. The writer was greatly shocked and immediately sent the collected fruits to ten botanical gardens all over the world, but later he received a communication from Sir W. W. SMITH that the seeds failed to germinate on account of their immaturity. For several years the writer was afraid that this new species of a beautiful monotypic genus might be extinct, but fortunately it was at last found to be quite common in the hills of Pukow on the northern bank of Yangtze just opposite Nanking. Now large quantities of seeds of this species have been collected and planted. It was later found also in Hwang Shan of Southern Anwhei. It is really surprising that a beautiful new genus of trees could be discovered as late as 1926 in the suburb of the capital of a country, especially in a scenic spot where numerous foreigners as well as Chinese have spent their holidays. That it should have escaped the searching eyes of a host of botanists and collectors is strange. Shortly afterwards, when he was just despairing of the rediscovery of this interesting tree, the writer one day recognized in a herbarium specimen sent by a friend who collected it in the surrounding hills of Nanchang, the capital of Kiangsi province, a second species of this new genus. This fruiting specimen was at first considered by a noted foreign botanist as representing insect-galls of a Styrax. When the flowering specimens were collected, it was proved that *S. Rehderiana* Hu (fig. 99) is really a second new species, though less handsome than the type species of this genus. It is interesting that the discovery of a second species follows so shortly after the establishment of this new genus, and that it is also discovered in a most easily accessible place near a provincial capital on the lower Yangtze.

Among other interesting new discoveries in South-Eastern China one must note the beautiful *Magnolia Zenii* Chen, found in the mountains not very distant from Nanking, and *Taxus Chienii* Chen, found in Chekiang. The discovery of a new Taxus is interesting enough, so is the discovery of a beautiful new Magnolia in an easily accessible region near the metropolis.

Previous to our exploration of South-Eastern China there was an erroneous though general belief entertained by western botanists that the floras of Western and Eastern China are markedly different. As late as 1931 Dr. ERNEST H. WILSON in a paper published in the Journal of the Arnold Arboretum still stressed this point. True, there are many genera and species endemic in Western China which are not found in the south-eastern provinces or vice versa, as for example, the genera Sinojackia and Monimopetalum of Western China; yet

many others which were first thought to be exclusively confined to West China have now been found in south-eastern provinces. The presence of *Pseudotsuga sinensis* in Southern Chekiang and *Tsuga chinensis* in Hwangshan of Southern Anwhei are two notable examples. The interesting monotypic conifer, *Fokienia Hodginsii* which was first discovered in Fokien, was found eastward in Southern Chekiang, and westward in Yunnan and Kweichow. So too, the other two interesting conifers, the forest giant, *Taiwania cryptomerioides* Hay and *Amentotaxus argentea* Pilg. both of which were formerly found in Formosa, were found also in South-Western Yunnan, the former also extending to Upper Burma. The writer had once counted among the known 650 species and varieties of trees and shrubs in Southern Chekiang 110 which should be considered as typical elements of Western China; and among the 500 species of the ligneous flora of Southern Anwhei there are 140 Western-Chinese species. Among the typical western elements we may mention a few such as *Fagus Engleriana, F. longipetiolata, Decaisnea Fargesii, Sargentodoxa cuneata, Fortunearia sinensis, Sycopsis sinensis, Bretschneidera sinensis, Poliothyrsis sinensis, Heptacodium miconioides, Camptotheca acuminata, Emmenopteris Henryi*, etc., besides the above mentioned conifers. Among the herbaceous species there are also such examples. *Habenaria Miersiana* is found both in Yunnan and Chekiang; the little western herb, *Sarcopyramis nepalensis* was found in Lushan of Kiangsi province on the lower Yangtze. Such new records have been frequently added. Now it seems certain that although there can be discerned two opposite directions of migration, one eastward and the other westward, there is no clear-cut distinction between the floras of Western and Eastern China. Only the previous ignorance of the flora of South-Eastern China led to such erroneous conclusions. There are some other new records of distributions in South-Eastern China which are interesting, *i.e.* the presence of *Kirengeshoma palmata* and *Conandron ramondioides* in the mountains of Anwhei, and the recent discovery of *Disanthus cercidifolia* in Kiangsi. These three monotypic genera were formerly known only in Japan.

Speaking of botanical exploration undertaken by Chinese botanists Prof. W. Y. CHUN's important contributions to the flora of Kwangtung and Hainan must be specially mentioned. In 1920, having just left Harvard University, Prof. CHUN spent nine months in intensive exploration in the interior of the tropical island Hainan, of Kwangtung province, braving malaria and land-leeches and suffering the absence of table salt for one or two months at a stretch. He was the first civilized man who climbed the mysterious Five Fingers Mountain of that island. Unfortunately his first important collection was burned in the store of a steamship company. Prof. MCCLURE of Lingnan University of Canton continued the exploration in Hainan for several years. It was on the basis of most of MCCLURE's Hainan collections that Dr. E. D. MERRILL wrote his important Enumeration of Hainan Plants. In later years Prof. W. Y. CHUN has again organized several



C. R. Feng Del. et Lith.

SINOJACKIA REHDERIANA Hu

芮氏挪拉木

FIG. 99.—SINOJACKIA REHDERIANA.

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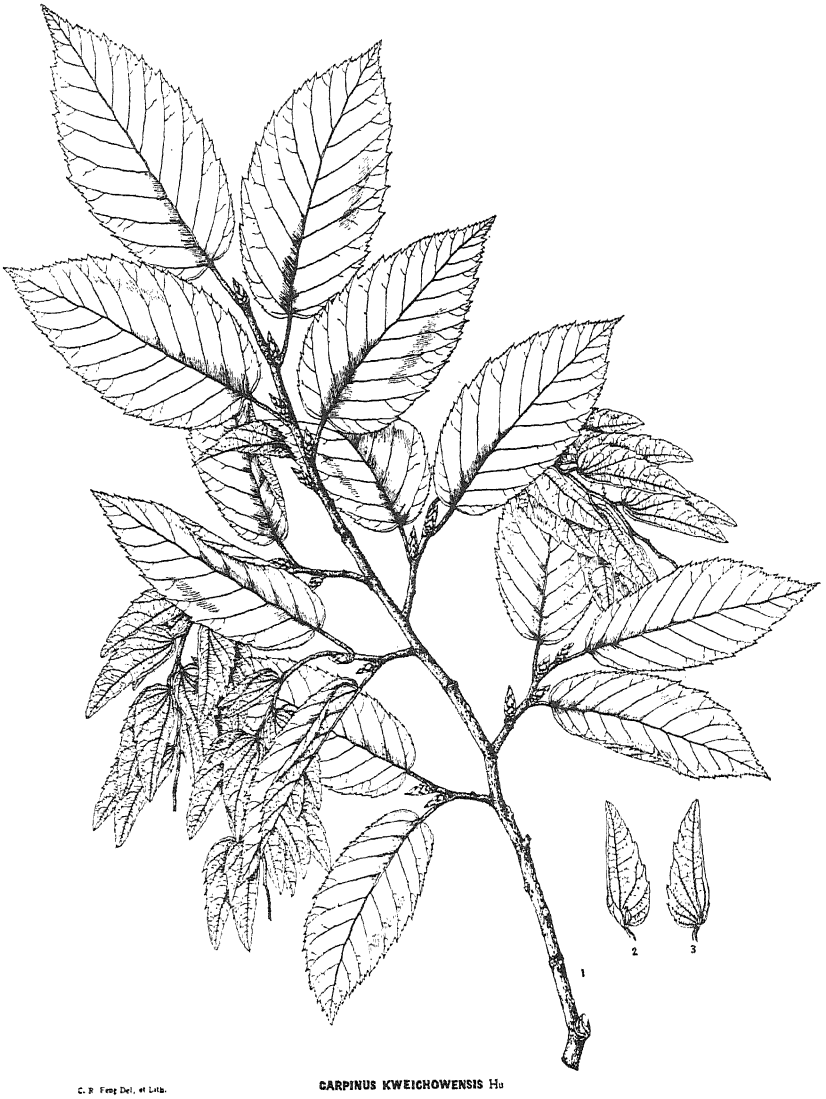


FIG. 100.—CARPINUS KWEICHOWENSIS.

important expeditions into Hainan and made extensive collections. The novelties discovered in this island are numerous, many tropical genera and families were for the first time recorded here which were not previously known on the mainland. For instance, the family Ochnaceae is represented in Hainan by the genera Ochna and Ouratea, Dilleniaceae by Tetracera, Dipterocarpaceae by Vatica. Hainania of the family Tiliaceae is an endemic genus named after this island. The taxads, *Dacrydium Pierrei*, *Podocarpus javanicus* and *P. nankoensis* were first recorded in this island. There is also an endemic conifer in *Pinus Fenzliana*. Other novelties are too numerous to be enumerated here. It was found that the floristic affinities of this island are closest to those of Indo-China.

The flora of Hainan has great economic importance. Many trees in the primeval forests yield excellent timber. Many other plants are of great horticultural value. Prof. W. Y. CHUN has established a good-sized nursery in the Botanical Institute of the National Sun Yatsen University, in which many beautiful plants from Hainan and other parts of Kwangtung are introduced into cultivation. The writer feels that many endemic species of this island should be introduced into England as hothouse plants.

Prof. CHUN in late years has also made very extensive and systematic exploration in different parts of the province Kwangtung where previously only sporadic explorations were made by western botanists. Numerous new species and new records of distributions have been discovered. It is interesting to note that such northern genera as Tilia and Fagus have been discovered in the northern part of the southmost province. Zenia of Caesalpiniaceae, and Chunichites of Apocynaceae are the new genera recently discovered from this province.

Prof. R. C. CHING in 1928 conducted an extensive botanical expedition in Kwangsi, a province adjacent to Kwangtung, and made very large collections. Previously only a few hundred species had been recorded from this province. Many new species were discovered on this expedition, especially along the mountain range Shih-wan-da-shan on the border of Indo-China. The interesting new family, Rhoipteleaceae, with the type species *Rhoiptelea chiliiantha* Diels et Hand-Mazz., was discovered on the border of Kwangsi and Indo-China. This tree was later discovered also in Yunnan and Kweichow. It is an amentiferous tree with pinnate leaves and pendulous panicles, with polygamous apetalous flowers and winged fruits. Another species of Dipterocarpaceae, *Hopea sinensis* Hand-Mazz., was also discovered in this region. In directing the activities of the Botanical Institute of Kwangsi province, Prof. W. Y. CHUN is now continuing the work of botanical exploration first started by Prof. CHING.

In 1930 the Metropolitan Museum of Academia Sinica sent Mr. Y. TSIANG to conduct an extensive botanical expedition to Kweichow province from where Lèveillè had described numerous new species. A very important collection of herbarium specimens has been made

and many new species discovered by Mr. TSIANG there. A new species of the new genus Rehderodendron of Styracaceae established by the writer, *Rehderodendron kweichowense* Hu, and the interesting *Carpinus kweichowensis* Hu (fig. 100), with unusually large fruiting bracts, are among a host of new species discovered. The discovery in Kweichow of a new Tsuga, *Tsuga longibracteata* Cheng, should also be mentioned in this connexion. This collection is important as this province is noted for its floristic rich endemicism and the flora is still little known and few herbarium specimens distributed.

The rich flora of Western China has been intensively studied by numerous western botanists, but by no means exhaustively. Interesting new species were discovered when the province Szechwan and Eastern Tibet were lately explored by Chinese botanists. The discovery of the new genus Rehderodendron is very interesting. In 1931 Mr. F. T. WANG of the Fan Memorial Institute of Biology discovered by the roadside near a small temple midway up the sacred Mount Omei of Szechwan province, the type species of this genus, *Rehderodendron macrocarpum* Hu (fig. 101), a stately tree up to 10 m. high. Dr. ERNEST H. WILSON and many other eminent botanists who visited this famous mountain must have passed under the type tree. A second species, *R. mapienense* Hu, was discovered by Mr. WANG in the same year. Since the establishment of this genus, within five years, altogether eight species have been described, two from Szechwan, three from Kwantung, two from Yunnan and one from Kweichow. They are all stately trees. Such fortune rarely falls to a new genus of trees. Another interesting new species discovered in Szechwan is *Melliodendron Wangianum* Hu of Styracaceae, belonging to a new genus published by Handel-Mazzetti from Kwangtung. Both genera are beautiful trees; they should be introduced into England. The Szechwan species of Melliodendron at least will be hardy in this country. The beautiful *Styrax Hui* Rehd. lately discovered in Szechwan should prove of great ornamental value in cultivation. An extraordinary hornbeam, *Carpinus Fangiana* Hu (fig. 102), with leaves up to 27 cm. long and fruiting spikes 45 cm. long, was also discovered by the roadside near the type tree of *Rehderodendron macrocarpum*. It is a very common species in the upper part of Mount Omei. How it escaped earlier discovery is really a wonder.

Since 1933 the Fan Memorial Institute of Biology has conducted very extensive botanical exploration in Yunnan province. Nearly the whole province has been covered, and tens of thousands of herbarium specimens collected. The exploration of the southern part of the Chinese Shan States in 1936 was especially successful. Many new species have been discovered and new records of distribution made. This region is approximate to Siam in the south and adjacent to Burma in the south-west; the mountains rise as high as 2,200 m., the lowest altitude is 800 m. and the average altitude is 1,200 m. The primeval rain forests and jungles have not hitherto been explored by western botanists. The high altitudes of the mountains which

easily precipitate the moisture carried by the monsoon in contrast with the comparative aridity of the adjacent Upper Burmese territory, and the admixture of the Burmese and Indo-Chinese floristic elements, make the flora of this region even richer than that of the adjacent countries. The whole collection is now in the process of identification. From results already obtained, the flora of the Chinese Shan States seems to be even richer than that of the island Hainan which was so profitably studied by Dr. E. D. MERRILL and Prof. W. Y. CHUN. Among the new discoveries I may particularly mention one species of Aromadendron, *Aromadendron yunnanense* Hu (fig. 103), two species of Knema, *Knema yunnanensis* Hu and *K. Wangii* Hu, and two species of Pyrenaria, *Pyrenaria camellioides* Hu and *P. cheliensis* Hu. These three genera are new to China. There is, so far, one interesting new genus described by the writer. It is Chuniodendron of Meliaceae, with two species, *Chuniodendron spicatum* Hu (fig. 104) and *C. yunnanense* Hu (fig. 105). It is closely related to the genera Amoora and Aphamixis, differing in the spiked inflorescence and one-celled drupaceous fruits.

The family Theaceae is well represented in Southern Yunnan. The genus Hartia has three species in Yunnan with two in Kwangtung and Kwangsi. *Hartia serratisepala* Hu and *H. yunnanensis* Hu are the two new species of this very interesting genus found endemic in Yunnan. In *Camellia heterophylla* Hu (fig. 106) we found a magnificent new Camellia already in cultivation but unknown to science and horticulture in Europe and America. In sheer beauty and size it rivals *C. reticulata*, *C. spectabilis* and *C. japonica*. It is a pity that such a regal species has escaped scientific discovery till now. It differs from other species in having leaves of two different shapes, one suborbicular, one ovate-elliptic. It is imperative that this beautiful species should be introduced into cultivation. In this connexion the writer wishes to call attention to the fact that Yunnan is famous for the numerous varieties of beautiful Camellias. Over seventy varieties, all of great beauty, are cultivated in Yunnanfu, the capital of the province. When in season their splendour is not rivalled by any other flower. It is a matter not ascertained, but most probably true, that there may be more than one species which contributes to the wealth of varieties of cultivated Camellias in Yunnan. A detailed critical study of their affinities will be a very profitable task. It would be worth while in the interests of horticulture to get all these varieties introduced into Europe. At least the hothouse flora would be greatly enriched.

Among the new records of distribution the beautiful and interesting climber of Cucurbitaceae, *Hodgsonia macrocarpa*, should be first mentioned. This monotypic genus was established by Sir. J. D. HOOKER. It is a strong woody vine growing to 100 feet high, climbing over large trees. It was first discovered in Assam, and later found in Java and Indo-China. Before it was discovered in Southern Yunnan in 1934 by our collector, Mr. H. T. TSAI, it was unknown in China. Its large yellow flowers with the pendent finely-cut spiral fringe

on the petals are beautiful enough, but chief interest is found in its fruits. The latter are the size of a child's head; imbedded in the pulp are six large seeds the size of ducks' eggs; each is, however, composed of two seeds connate into one, one with a small and the other with a larger kernel, which taste like walnut. These seeds are highly prized by the natives as nuts; and even in the jungles one shilling will buy only two fruits. This vine, though not confined to the Chinese Shan States, is very common in this region. Among other new records of distribution the writer would mention *Knema Pierrei* Warg. of Myristicaceae, *Securidaca tavoyana* Wall of Polygalaceae, *Mesua ferrea* L. of Guttiferae, *Sterculia pexa* Pieere of Sterculiaceae, *Hibiscus macrophyllus* of Malvaceae, *Scleropyrum Wallichianum* var. *mekongensis* H. Lec. of Santalaceae, *Rourea Milletii* Planch. of Connaraceae, *Campanumaea lancifolia* Merr. of Campanulaceae and *Prosartema stellaris* Gagn. of Euphorbiaceae. *Duabanga sonneratioides* Buch. of Sonneratiaceae and *Mayodendron igneum* Kurz of Bignoniaceae though formerly known already in Yunnan, should also be mentioned here.

Among the new discoveries not confined to this region, but made in other parts of Southern Yunnan we must mention the interesting new genus Smithiodendron, named by the writer in honour of Sir W. W. SMITH, whose contributions to the study of Chinese Primulas and Rhododendrons are universally known. This monotypic genus comprises a small tree with leaves like those of the Chinese paper mulberry-tree, *Broussonetia papyrifera*, but the pyriform inflorescence is androgynous, with male and female flowers intermixed with peltate scales. The interesting new genus, Huodendron of Styracaceae, has three species in Yunnan with one variety in Kwangtung and one species, *Huodendron tibeticum*, extending to Hunan. The species *H. yunnanense* Hu was newly discovered in Southern Yunnan. The anomalous *Camellia polygama* Hu, with ovary sometimes completely aborted and inner whorls of stamens sometimes reduced to staminodes, should also be mentioned. Yunnan is very rich in species of Camellia, Eurya and Adinandra, several new species in each of these three genera having been discovered. Among other new records of distribution, the hickory of Indo-China, *Carya tonkinensis* H. Lec. and *Alniphyllum hainaense* Hay should also be here mentioned.

To summarize, several important facts have been found by the study of the flora of Yunnan. First, the flora of South-Western Yunnan may be said to consist of three elements, namely, the Burmese, the Indo-Chinese and the endemic. In Indo-Chinese elements, the South-Western Yunnan flora is closely related to that of Kwangtung, Kwangsi, Hainan and Formosa. Secondly, certain genera are richly developed in Southern Yunnan, for example, Camellia, Adinandra, Eurya. Thirdly, many Indo-Malayan genera are found only in South-Western Yunnan, but not elsewhere in China, *i.e.* Taiwania, Aromadendron, Prosartema, Knema (Horsfieldia of the same family has been found in Hainan), Kydia, Duabanga, Myodendron,



FIG. 101.—REHDERODENDRON MACROCARPUM.

[*To face p.* 388.



FIG. 102.—CARPINUS FANGIANA.



FIG. 103.—AROMADENDRON YUNNANENSE.

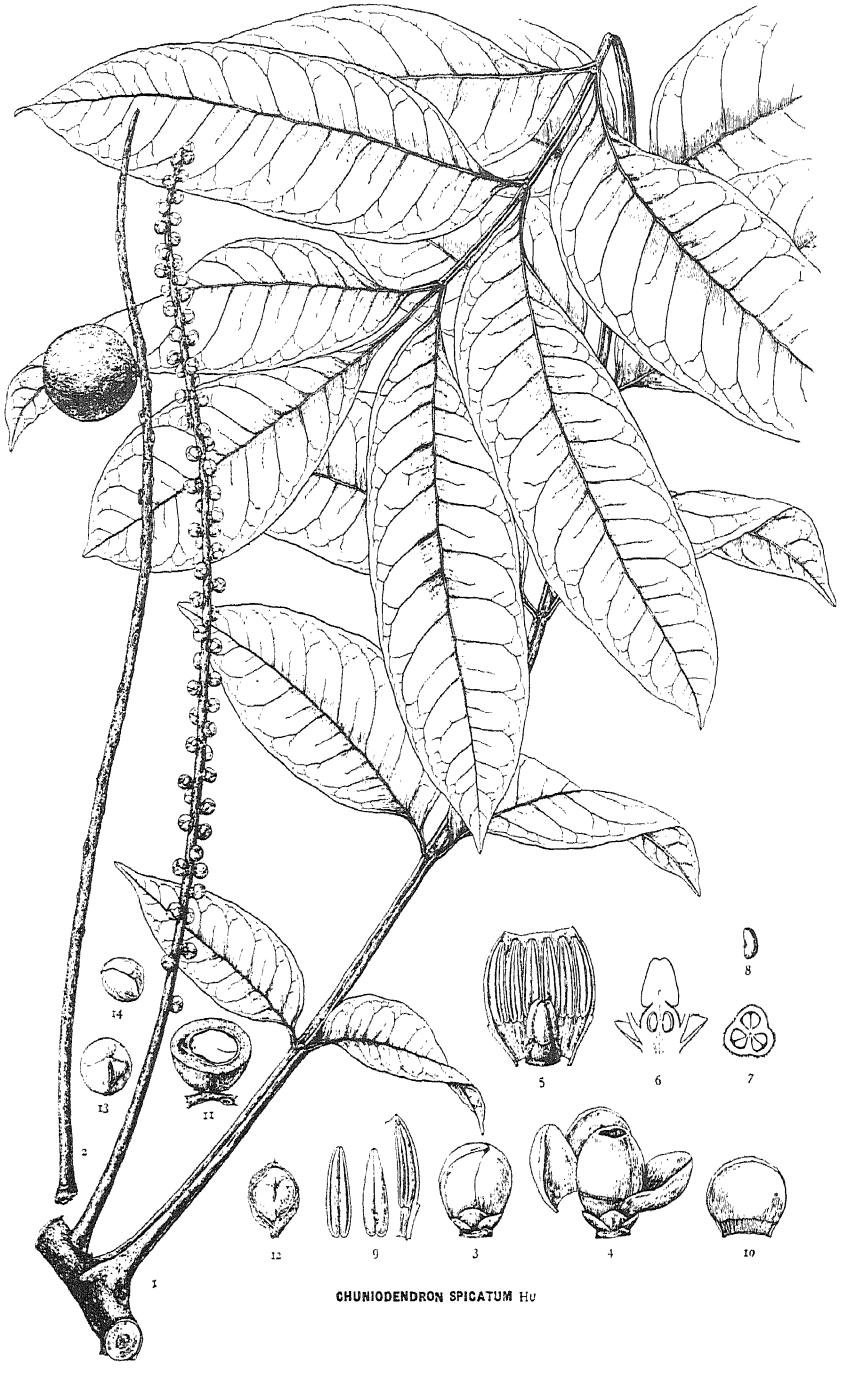


FIG. 104.—CHUNIODENDRON SPICATUM.

[*To face p.* 389.

Congea, Hodgsonia, etc. Fourthly, a number of rare genera are either exclusively endemic in Yunnan or are more numerously represented, *i.e.* Smithiodendron, Sinomerrillea, Dipentodon, Huodendron, Rhodoleia, Hartia, etc. Altogether South-Western Yunnan represents one of the richest floristic regions in the whole world.

A word should be said about the tempo of exploration by Chinese botanists in latter years. The collectors sent to the field are usually young men who have recently graduated from the universities. They are full of enthusiasm and energy. Being accustomed to the hardship of life in China, they can live more cheaply and work harder than their western colleagues. They usually collect most of the specimens with their own hands, although sometimes they have helpers to collect for them in other stations than their own. They collect very large numbers of duplicates. The general practice is to collect ten specimens to each number, and five to ten thousand numbers are commonly collected each year. They are usually willing to endure greater hardship than their western colleagues, and succeed in penetrating into regions usually considered inaccessible. These facts may count for their many new discoveries even in regions repeatedly covered by western botanists. The fortitude and accomplishment they manifest in the exploration in the malaria-ridden wildness of Hainan and tropical Yunnan are highly commendable. One drawback accompanying such large-scale collections is that they cannot make very careful field notes; the task of preparing and shipping these enormous collections is great enough. Yet it may not be a bad policy to make at first collections as large as possible so as to insure a greater number of discoveries and leave much more detailed studies to later years when opportunities permit. The extraordinary wealth of the Chinese flora seems to be able amply to reward their enthusiasm and energy. Further important botanical as well as horticultural discoveries may still be expected from their strenuous efforts.

THE ATTACK OF THE BISHOP FLY (*LYGUS PRATENSIS*) ON CHRYSANTHEMUMS IN 1937.

I. Report of a Discussion between Growers and the Scientific Committee on April 5, 1938.

[Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair.]

A précis of present knowledge of this insect prepared by Mr. G. Fox Wilson, N.D.H., F.R.E.S., was before the meeting (see p. 392).

The Chairman introduced the subject and invited growers present to relate their experiences.

Mr. Milton Hutchings said he had used several sprays and found dry sprays useless. He found 'May Wallace,' 'Thanksgiving Pink,' many singles, 'Absolute' and 'Enid' very susceptible to attack, but others less liable. The worst attack came in early September.

Mr. Shawyer said he feared no grower had obtained complete mastery of the bug. The main difficulty has been lack of a really efficient spray which is not injurious to the plant, and can be made and applied at such cost as the small margin of profit with this crop will bear. He thought that efforts to eradicate the bug from the immediate neighbourhood of the nursery might be nullified by the invasion from outside, and suggested that perhaps something could be got *into* the plants which would render them distasteful to the bug: of somewhat less value would be something obnoxious to the bug that could be put *on* the plant.

Possibly something could be done by breeding from the less susceptible varieties.

Mr. Shawyer thought that nicotine was perhaps not so effective as some other things, and that only keen observation and judgment could determine whether a wash was injurious to foliage.

Various suggestions had been made to him. For instance, that small collections were easier to keep clean than large: that greater spacing for plants might be an advantage, but there is danger of damage by the sun if spacing is too wide.

The question of the type of spray to apply—whether a drench or a mist spray—needs consideration. The time of application is also probably important—possibly the insect may be less active in early morning than later. Further the weather, whether showery or bright, may affect the position of the insect and need alteration in the direction of the spray.

The cost of the spray is important, though not of the first importance.

Mr. MOSLEY thought the difficulties of control increased progressively with larger areas of Chrysanthemums. There is, he thought, greater difficulty in giving a drenching spray, and there is higher probability of the insect escaping wetting. Mass invasion from without needs to be watched for carefully and spraying applied immediately it occurs.

The use of dust sprays especially may be inimical to the workmen, even when protected by masks, etc., and this is a special danger in a large place. It may be that a more resistant type of insect is being developed.

Mr. MOSLEY thought whale oil soap and nicotine were on the whole the most effective. Resin soap had resulted in some injury to the plants. Possibly a very fine mist-spray will give better and more penetrating results than the type usually used.

Dr. BEWLEY said that attempts to get plants to take up substances that would kill insects attacking them had failed at Cheshunt.

Mr. MOSLEY thought that a high proportion of potash in the soil helped to give the plant artificial immunity.

Mr. HUTCHINGS expressed his regret that there seemed no repellent, and that from remarks made it appeared that overhead damping with water had little beneficial effect.

Dr. BEWLEY and Mr. MOSLEY, however, thought that overhead damping had a deterrent effect.

Mr. CHITTENDEN inquired whether nicotine spraying after overhead damping had been tried, or whether a fine wire or other screen (since the insect does not apparently fly high), had been found a deterrent.

Mr. MONRO reported that a Worthing grower had found a belt of trees an excellent screen, and with another grower an apple orchard had apparently screened him from attack.

Mr. HUTCHINGS reported that in Sussex Chrysanthemums partially shaded during part of the day had escaped, while the same variety in the sun had been ruined. In his own case 'Thanksgiving Pink' had been less attacked nearer trees than further away.

Mr. FOX WILSON reported capture of Lygus in experiments at Rothamsted with a 300 c.p. lamp, 3 feet 6 inches above the ground.

Mr. MOSLEY mentioned the protection gained in one instance by a piece of thin fish netting over the plants giving a chequered and moving light and shade.

Dr. BEWLEY said that a peculiarity of the past season was the invasion of glasshouses, for plants therein suffered much. Others reported similar experiences.

Mr. AUSTIN on the value of repellents reported some success following the regular application of flowers of sulphur, which Mr. HODSON corroborated, but thought it 'made a mess of the plants.' Naphthalene dust he found had proved of value when used every third day, but that was not satisfactory.

Mr. MILES had found both dusts of some value and thought further experiments desirable.

Mr. SHAWYER remarked upon the possible effect of lowered temperature, as after rain, or in shade: the lowered temperature being better for the plant and less pleasant for the insect.

Mr. HODSON said he had reports of migration of this insect to warmer spots.

Mr. HODSON also stressed the need for testing other than the stereotyped spray materials, for it is unlikely that the best had yet been found.

Other speakers referred to the hosts other than Chrysanthemums and the re-infection that often comes from these.

Mr. BOWLES suggested a screen of coir steeped in carbolic and a 'light-trap' at night as worthy of trial.

Various speakers mentioned as being badly attacked 'Autocrat' 'American Gold,' 'Thanksgiving Pink,' 'Favourite,' 'Conqueror' 'Rufus,' 'May Wallace,' 'Apollo.' Mr. STEVENSON found 'Almirante,' 'American Beauty,' 'Alcade,' and 'Sanctity' rarely if ever damaged.

Mr. AUSTIN mentioned a predatory bug as attacking Lygus, viz. *Anthocoris nemorum*, but the amount of good done was small, and few other parasites were known.

II. THE TARNISHED PLANT BUG OR BISHOP FLY, *LYGUS PRATENSIS* L.—PRÉCIS OF PRESENT KNOWLEDGE.

By G. FOX WILSON, N.D.H., Entomologist, R.H.S. Gardens, Wisley.

THIS Capsid Bug is widely distributed, and is an important pest of fruit trees, vegetables and ornamental plants in Europe, Canada and the United States.

The egg, larval and adult stages of *Lygus pratensis* Linn. have been frequently described, and it is necessary here only to outline the life cycle, with special relation to Chrysanthemum growing.

Signs of Attack.—Several types of injury occur on Chrysanthemums, namely, stunted and malformed shoots, twisted and scarred stems, blind buds, puckered leaves, and small distorted and misshapen blooms. Similar damage may, however, occur on these and other plants as a result of attacks of at least two other species of Capsids, but the chief culprit is the Bishop Fly. This bug is active through all its stages and feeds by piercing the plant's tissues.

The primary damage is caused *during the feeding* when an irritant is injected into the plant. This results in the various types of malformation already described.

Damage may appear to be more severe on disbudded plants owing to the concentrated attack by the bugs on those buds which remain.

Life History.—The adult bugs overwinter in rubbish heaps, long herbage, dry refuse, wood piles, hollow stems of herbaceous plants (Delphinium, Hogweed and similar things), in cracks in wooden structures, etc.

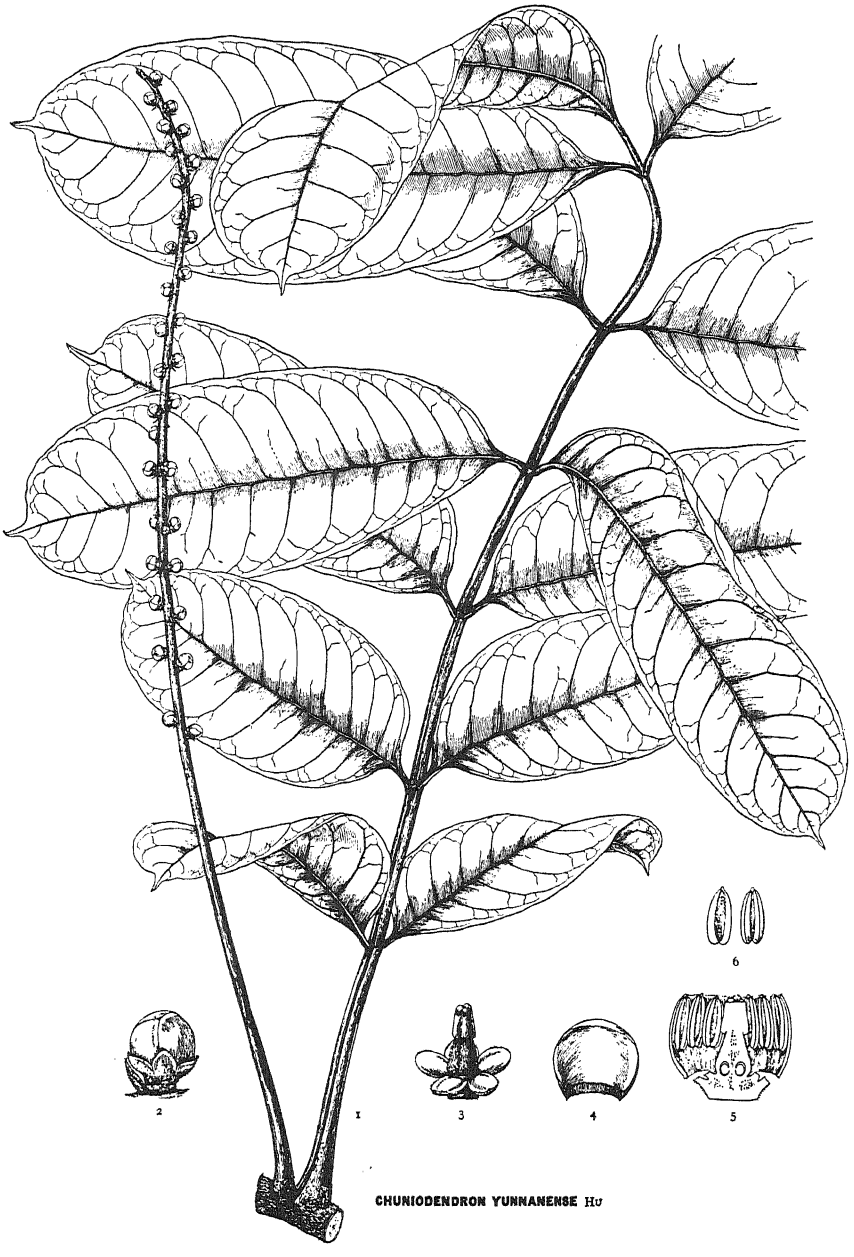


FIG. 105.—CHUNIODENDRON YUNNANENSE.



FIG. 106.—CAMELLIA HETEROPHYLLA.

[*To face p.* 393.

It may possibly overwinter also in the egg stage and, as this is probable, it should not be overlooked. There is a high mortality of hibernating adults, and this may explain the small amount of damage done to crops during early spring. Injury has, however, been seen on Chrysanthemum cuttings as early as March.

The over-wintered adults become active in spring, and egg-laying occurs during April and May. The eggs have been found in the flower-buds and flower-stalks of Groundsel, in Dock, Erigeron and other weeds. The flask-shaped, creamy-white eggs are inserted in the stems of the host plant, the scars made by the ovipositor of the female indicating the position of the eggs. The eggs hatch within a fortnight and the nymphs vary very much in colour, and are extremely active and run about over the plants, and feed on the leaves and buds. The nymph moults several times, the wings being acquired only at the last moult when the bug is mature. Maturity is reached from June onwards, and a second brood of nymphs occurs about early August.

The bugs are usually first seen on Chrysanthemums in summer, and later both adults and nymphs are found, especially in late July to September, while they may be present on plants in the open as late as November and to the end of December in glasshouses.

While there is on occasion a slight attack on the plants in spring there is a definite cessation of attack until late July owing, in all probability, to the fact that the eggs during this period are within the plant tissues.

This bug is definitely double-brooded, but it is not yet established whether all the eggs laid in August and September hatch during the same season or whether some remain throughout the winter and hatch in spring.

The adult bugs are known to migrate from wild to cultivated plants in late summer, and appear to fly low, for they are observed to alight on plants at a height of about 3 feet from the ground. This statement is corroborated by the fact that adults landed at about this height on 5-foot canvas screens placed round open beds of Chrysanthemums.

It appears from observations made at Wisley over a period of seventeen years (1921–1937) that climatic conditions affect to some degree the migration of the bugs from wild to cultivated hosts. Massed migrations were observed to occur at Wisley during the very dry Augusts of the following years—1921, 1933, 1936 and 1937—from wild hosts, which were suffering from a prolonged drought, to the luscious growths of the perfectly nourished, irrigated plants of Dahlias. It seems that plants kept well-watered during a dry period prove more attractive to the bug than do those which are suffering from shortage of water.

The injury to the flower buds of Chrysanthemums is frequently overlooked until the blooms begin to open owing to the damage done by the bugs being hidden by the sepals and foliage.

Bugs are often brought into glasshouses on plants which have been standing in the open, and attention should be given to destroying these bugs before the plants are moved.

DEGREE OF ATTACK BY *LYGUS PRATENSIS* ON CHRYSANTHEMUMS.

Dahlias, Arctotis or Venidium at Wisley, 1921–1937.

(A.N.=Above Normal; B.N.=Below Normal; N.=Normal.)

1921	A.N.	1930	A.N.
1922	B.N.	1931	B.N.
1923	B.N.	1932	A.N.
1924	B.N.	1933	A.N.
1925	B.N.	1934	A.N.
1926	N.	1935	N.
1927	N.	1936	A.N.
1928	A.N.	1937	A.N.
1929	A.N.		

The most serious damage to cultivated plants occurred during the years 1921 and 1937. Speaking generally, the worst attacks were found in autumns of high temperature, much sun, and low rainfall.

Host Plants.—The Tarnished Plant Bug feeds on a wide range of plants, including fruit trees and bushes, forage crops, cereals, vegetables, herbaceous plants, annuals, and numerous weeds.

Some of the more favoured hosts in this country are:

Fruits.—Apple, Blackberry, Currants, Gooseberry, Pear, Plum, Strawberry.

Vegetables.—Beet, Broad Bean, Potato.

Forage Crops.—Lucerne, Red Clover, Vetch.

Herbaceous Plants.—Aster, Chrysanthemum, Dahlia.

Annuals.—Arctotis, Chrysanthemum, Venidium, Zinnia.

Weeds.—Black Nightshade, Dock, *Erigeron canadensis*, Groundsel, Stinging Nettle, Sorrel.

There appears a marked difference in susceptibility of varieties of Chrysanthemum to attack by this pest, and among those frequently reported are: 'American Beauty,' 'Christmas White,' 'Favourite' and its sports, 'Friendly Rival,' 'May Wallace,' 'Monument,' 'R. A. Root.'

CONTROL.

Cultural Methods.—Measures of primary importance for reducing the population of bugs in an infested area include the destruction or removal of the natural habitats. It is, therefore, desirable to pay particular attention to the sources of infestation, and to destroy all weeds in the vicinity of borders and glasshouses; to prevent the accumulation of dry rubbish both within and near glasshouses; to fire over rough grass and long herbage in headlands, ditch-sides, accommodation roads and thickets in midsummer; to clear fallen leaves and rubbish from hedge bottoms in winter; to grub or renovate neglected Currant and Gooseberry plantations; and to cut down

herbaceous stems to ground level so that no "snags" remain. All such areas either form breeding places or provide suitable over-wintering quarters for the adult bugs.

Chemical Methods.—Weekly applications of a nicotine-soap wash to Chrysanthemum plants over an extended period, *i.e.* from early August to late September, will provide satisfactory control by destroying a vast number of both immature and mature bugs. Satisfactory control is obtained only when a drenching spray is applied through a coarse nozzle so that the insects *are actually hit by the wash.* Care must be taken to wet both surfaces of the leaves and to drench the ground beneath the plants with the spray fluid to destroy those bugs which drop to the soil when the plants are disturbed by the jet or the operator.

Periodic dusting of the plants during their early stages of growth with nicotine dust is also effective in destroying all but the eggs of the pest. Dusting the plants with flowers of sulphur has on certain occasions a considerable effect in repelling the bugs from feeding on the dust-covered foliage of Chrysanthemums.

The operation either of spraying or dusting will be nullified if the surroundings of the plants in the open or under glass are allowed to remain weedy, for such areas are potential breeding places of the Tarnished Plant Bug.

Mechanical Measures.—Hand-crushing the bugs is an operation that should be encouraged and may be carried out by the workers engaged in disbudding. It is possible to keep a batch of plants relatively clear of the pest by this method, provided the workers are taught to recognize the insect in its various stages.

The provision of trap plants, which are used to attract the adult bugs so that they may be destroyed by hand-crushing, spraying or dusting, is worthy of serious consideration. The flower discs of Arctotis, for instance, were found at Wisley to be specially favoured by the bugs and a concentration of the adults occurred on these flowers during late July and throughout August. It was possible to destroy large numbers on the flowers of these plants by dusting with nicotine dust.

Overhead watering and frequent syringing of Chrysanthemums appear to have no repellent effect on the bugs. Plants when so wetted are found to be as severely attacked as those which are not syringed. It is found that the bugs become sluggish and shelter beneath the leaves, in the axils of the buds, and elsewhere when the water is applied overhead or during rain showers, and they are difficult to dislodge from the shoots.

It may be desirable to screen beds of susceptible varieties of Chrysanthemums with cheesecloth fixed over a light framework similar to the structures placed over other crops to keep pests at bay. For instance, it is not uncommon to find beds of Celery screened to keep them clear of Celery Fly, Cabbage seed beds from the Cabbage Root Fly, and valuable varieties of Narcissi screened to keep the bulbs clear of Bulb Flies.

III. Summary and Observations by the Secretary, R.H.S. Scientific Committee.

1. After hearing the observations and discussions on Lygus and Chrysanthemums and reading the précis referred to in paragraph 1 of the summary to which this is appended, I am wondering whether attempts have been made by growers to apply all the knowledge at present available concerning the life and habits of the pest.

Entomologists have given a fairly full account, and I make the following notes and suggestions in an endeavour to indicate measures that might be tried in the hope of keeping the pest within bounds without in any way suggesting that these are the only ones.

2. A native insect which breeds and feeds upon a vast number of different plants of diverse types, many of which are almost certain to be in the neighbourhood of Chrysanthemum nurseries, and which is active in all its stages and especially liable to migrate to fresh plants in the adult winged stage, is unlikely to be completely controllable by spraying alone.

3. Consideration of the life-history and habits of *Lygus pratensis* suggests that if all possible precautions are taken to prevent hibernation in the neighbourhood of Chrysanthemums and to destroy weeds, attacks will be small until the summer winged stage is reached in July, August and September.

4. Observations also show that the severity of the attack is to a great extent dependent upon the weather, and a hot dry autumn may result in a considerable prolongation of the attack. It is thus unwise to lay down a fixed spraying programme. Deterrent spraying cannot be relied upon, though sulphur dusting may have some effect. Sprays are only effective when they hit the insect.

Spraying must be done as soon as the insect is seen on the plants and continued as long as it is present. This involves the power of recognizing the insect, and this power should be extended to the recognition of all stages from the young larvæ onwards.

5. The spray used must be (*a*) deadly to the insect; (*b*) harmless to the plant; (*c*) harmless to the user provided reasonable precautions are taken; (*d*) capable of application without undue injury to available apparatus; (*e*) cheap.

6. Since only contact sprays are of any value the spray must be capable of wetting, *i.e.* it must contain a spreader such as saponin.

7. Spray damage to plants depends not only upon the poisonous action of the spray used, but upon physiological disturbances connected with the atmospheric conditions existing at the time. Both from the fact that the insect is more quiescent then, and for the sake of the plant, spraying at dusk would probably be more deadly to the insect and less damaging to the plant.

8. Spray materials available are mainly nicotine, derris, pyrethrum, of which the one most likely to be harmful to the operator is nicotine.

Either of these in combination with a suitable spreader should, if applied properly, kill all insects hit.

9. Proper application means the covering of every part of the plant with a film of the spray used, and this is probably best attained by the use of a mist spray rather than a drench and applied always down wind instead of against or across it. Very high pressure is now used by fruit-growers with advantage and would probably pay with this type of spraying. Either a permanent installation or mobile power sprayers would be needed—knapsacks do not give the desirable pressure and are not economical of man-power where any considerable area is involved.

10. With an active insect of this type disturbance such as is involved in spraying will cause many to leave the plants when spraying commences to go to adjacent plants. It would, therefore, seem desirable to spray as large an area as possible within a very short space of time, which again involves a large spraying outfit.

11. Bearing in mind the known habit of the insect that it is less liable to travel in moist weather than in dry, preliminary damping of the plants with water followed by spraying before dry conditions are restored would probably kill more insects than spraying when the plants are dry. Some adjustment in the strength of spray solution might be needed to meet this condition, and a drench spray would certainly not be wise.

12. Observations show that plants are safer in shade than in sun, and it is a matter for consideration how far shade can be provided for Chrysanthemums.

13. Observations also show that the insect does not usually fly at over 6 feet. Screens of close-mesh wire or coir placed on the windward side or on the side where other food plants are growing, if not all round, might well check this flight. A further advantage would be gained by smearing the screen with such a material as tangle-foot.

14. Spraying other food plants when found to be attacked would be a wise measure, and it might even pay to plant widths of attractive plants as traps which could be sprayed periodically.

15. The fact that lights of 300 c.p. attract this insect gives a further opportunity of trapping it and reducing its numbers during the time of the greatest infestation in July and August.

16. It is almost a truism that there is great advantage in having the crop in good health, neither too soft nor too hard, but so far, apart from this, it does not appear probable that the plant can be induced to take up any substance repellent to the insect.

17. Variety susceptibility may need to be taken into consideration where attacks are persistent, and breeding for resistance might be a line worth following up.

F. J. CHITTENDEN.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Adenocarpus anagyrifolius. A.M. June 21, 1938. From F. C. Stern, Esq., Goring-by-Sea. A pretty species from Morocco, forming a freely branched bush about 8 feet high, with small, glaucous, ternate leaves and many short racemes of bright yellow, pea-shaped flowers. Although hardy in the exhibitor's garden, it is likely to require protection in less favoured localities.

Begonia 'Margot Lipscomb.' A.M. June 21, 1938. From Messrs. Blackmore & Langdon, Bath. A very handsome tuberous-rooted variety with large double blush-pink flowers.

Delphinium 'Blue Monarch.' A.M. June 21, 1938, as an exhibition variety. Raised and shown by F. A. Bishop, Esq., Clewer Green, Windsor. Flower spikes pyramidal, 3½ feet long with few strong side spikes. Flowers semi-double, 2¾ inches across, rich azure-blue with a pinkish-mauve flush; eye small, white.

Delphinium 'Brigadier F. E. Hotblack,' A.M. June 28, 1938, as an exhibition variety. Raised and shown by H. S. Hotblack, Esq., Deaks, Cuckfield, Sussex. Flower spikes of good form, pyramidal in shape, 3 feet long, with evenly spaced semi-double flowers, 3 inches across, of a clear pinkish-mauve shade somewhat flushed sky-blue towards the margin of the petals; eye large, black.

Delphinium 'Italia.' F.C.C. June 28, 1938, as an exhibition variety. This plant received an **A.M.** in 1935. Raised and shown by Messrs. Blackmore & Langdon. Plant of vigorous growth and good habit with pyramidal flower spikes over 3 feet long. Flowers semi-double, 2½ inches across, rich clear gentian blue; almost a self-coloured flower; eye small, white.

Delphinium 'June Lady.' A.M. June 21, 1938, as an exhibition variety. Raised and shown by F. A. Bishop, Esq., Clewer Green, Windsor. Flower spikes 2½ feet long, with closely set flowers; side spikes few, strong; flowers 3 inches across, soft pinkish-mauve with a faint azure-blue flush; eye medium, brown.

Delphinium 'Mavis.' A.M. June 28, 1938, as an exhibition variety. Raised and shown by Messrs. Blackmore & Langdon. Flower spikes 2½ feet long, pyramidal in form. Flowers semi-double, 2½ inches across, evenly spaced, rich purple, outer petals flushed violet; eye of medium size, white.

Delphinium 'Naomi.' A.M. June 21, 1938, as an exhibition variety. Raised and sent by Messrs. Blackmore & Langdon. A strong-growing variety 4½ feet tall, with pyramidal flower spikes 2½ feet long and few strong side spikes. Flowers semi-double, 2¾ inches across, rich violet-blue with a purple flush towards the eye; eye small, black.

Delphinium 'Natalie.' **A.M.** June 21, 1938, as an exhibition variety. Raised and sent by Messrs. Blackmore & Langdon. Plant of vigorous growth, 5½ feet tall, with pyramidal flower spikes over 3 feet long and few strong side growths. Flowers semi-double, 3 inches across, clear deep sky-blue with a light pinkish flush; eye small, black.

Delphinium 'Purple Prince.' **A.M.** June 16, 1938, as an exhibition variety. Raised and shown by Messrs. Blackmore & Langdon. Spikes cylindrical, over 3 feet long with few weak side spikes. Flowers semi-double, 2¼ inches diameter, deep rich violet-purple self; eye very small, white.

Delphinium 'Tessa.' **A.M.** June 16, 1938, as an exhibition variety. Raised and shown by Messrs. Blackmore & Langdon. Flower spike pyramidal with few strong side spikes. Flowers semi-double, 2¾ inches across, soft pinkish-mauve with an azure-blue flush; eye small, white.

Dracocephalum Hemsleyanum. **A.M.** June 21, 1938. From Lionel de Rothschild, Esq., Exbury, and F. C. Stern, Esq., Goring-by-Sea. A good herbaceous plant, 18 to 24 inches in height, with softly hairy, grey-green, aromatic foliage. The flowers are 1 inch long, tubular and dilated in the upper half, bright blue externally and speckled with dark blue on white inside the throat.

Eremurus 'Lady Falmouth.' **A.M.** June 21, 1938. From F. C. Stern, Esq. One of the most handsome hybrids raised by the exhibitor, having a massive stem 6 feet high, completely covered in its upper half by large flowers of rich orange-buff colour.

Hieracium villosum. **A.M.** June 8, 1938. From Messrs. M. Prichard, Christchurch. A European Hawkweed with large bright yellow stellate flowers on 6- to 8-inch stems. The flower stalks and the fleshy grey-green elliptical leaves are covered with long white hairs.

Leptospermum lanigerum, Giblin's var. **A.M.** June 21, 1938. From Lt.-Col. L. C. R. Messel, Handcross. A very fine Tasmanian form with pure white flowers over ¾ inch across, very freely produced. The shoots are silky in the young state, and bear lanceolate, acute leaves ½ inch long.

Lilium × Beerensii. **A.M.** June 8, 1938. A hardy hybrid, first flowered by Messrs. Ware of Tottenham in 1895, and now reproduced by crossing *L.* × *testaceum* with *L. chalcedonicum* is attractive and vigorous. The flowers, of the shape and pose of *L. testaceum*, are borne in an umbel of as many as twelve in number at the head of a stem up to 4 feet in height; the petals are light vermilion-red and the prominent anthers have scarlet pollen. The foliage is similar to that of the parents and more or less appressed to the stem. Raised and exhibited by D. Boyes, Esq., "Thorpe," Huntingdon Road, Cambridge.

Lycaste Locusta, Sander's var. **A.M.** June 8, 1938. A Peruvian species originally described by Reichenbach in 1879. The present example has been cultivated for some years in the collection of Sir Jeremiah Colman, Bart., Gatton Park, Surrey, and bore six large dark olive-green flowers, the fringed margin of the labellum somewhat lighter, and the column whitish. The flowers emit a pleasing pineapple scent.

Malvastrum puniceum. A.M. June 21, 1938. From F. C. Stern, Esq., Goring-by-Sea. A dainty South African shrub, which has been grown in the open by the exhibitor for three years without protection. The slender branches bear small, ovate-oblong, lobed leaves and axillary, rose-pink flowers about 1 inch across.

Mimulus glutinosus. A.M. June 21, 1938. From Admiral A. Walker-Heneage-Vivian, Swansea. A Californian sub-shrub which will succeed out of doors in warm localities, although more generally useful in the cool house. The somewhat straggling stems bear sticky, dark green leaves and large, typically buff flowers. The form shown had flowers of a pretty shade of orange-red.

Odontoglossum × 'Dauphin' var. 'Alaska.' A.M. June 21, 1938. This attractive hybrid, obtained by crossing *O. crispum* with *O.* × 'l'Empereur,' bore an arching spike of ten large flowers, blush-white, the sepals tinged with rose, the labellum freckled with reddish colour on the marginal area. The sepals are much broader than usually seen in this class of hybrid. Exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Odontoglossum × 'Dauphin' var. 'Princess Royal.' A.M. June 21, 1938. This beautiful hybrid resulted from the crossing of *O. crispum* with *O.* × 'l'Empereur.' The flowers, five of which were carried on the spike, resemble a glorified form of the first parent, being blush-white and having unusually well-developed segments, the petals almost meeting in front of the sepals. The labellum is freckled with reddish crimson and has a yellow crest area. Exhibited by Messrs. Armstrong & Brown, Tunbridge Wells.

Odontonia × 'Ceylon Ruby' var. 'Colombo.' A.M. June 8, 1938. This attractive hybrid was raised by Messrs. Charlesworth, Haywards Heath, through crossing *Odontonia* × 'Avril Gay' with *Odontonia* × 'Nestor.' The arching spike bore four flowers, with reddish-crimson blotching on the sepals and petals, the labellum with a large blotch of similar colour on the basal half, the apical half stippled with rose-purple.

Olearia chathamica. A.M. June 21, 1938. From Colonel Stephenson R. Clarke, Haywards Heath. A very attractive species from the Chatham Islands. The toothed leaves are tomentose beneath and of somewhat leathery texture. The large, solitary flower-heads have bright purple discs and lilac ray-florets.

Paeonia suffruticosa 'Comtesse de Tudor.' A.M. May 24, 1938. From F. C. Stern, Esq., F.L.S., Goring-by-Sea. A very handsome blush-pink double variety raised by Charles Gambault in France between 1856 and 1866. It was introduced by Messrs. Lemoine of Nancy.

Rhododendron × 'Beau Brummell.' A.M. June 8, 1938. A cross between *Rhododendron eriogynum* and *R.* × 'Essex Scarlet,' shown by Lionel de Rothschild, Esq., Exbury, Southampton, as a hardy flowering shrub for the woodland garden. Neat globular trusses of about thirty funnel-shaped flowers up to 2 inches wide by

1¾ inch deep, clear deep red, speckled darker within, anthers black. The narrow ovate-oblong leaves, up to 6 inches long by 1¾ inch broad, are dull green and slightly bullate above with the midrib depressed, thinly brown-tomentose below.

Rhododendron cerasinum. A.M. June 8, 1938. Collected by Kingdon Ward under number 6923, and exhibited by Lt.-Col. L. C. R. Messel, Nymans, Handcross, Sussex. This is the form whose colour is usually described as "cherry-red." It is a beautiful deep colour, almost crimson, with a bluish bloom.

Rhododendron crassum var. A.M. June 21, 1938. Shown by Lt.-Col. Bolitho, Trengwainton, Heamoor, Cornwall. This plant, a seedling from *R. crassum*, raised at Trengwainton, has striking flowers, deep rose in bud, opening with white corolla lobes, the rose being retained on the tube without, but gradually fading to pale rose.

Rhododendron × 'Fancy Free.' A.M. June 8, 1938. A cross between *Rhododendron eriogynum* and an unnamed hybrid under number T.L. 1690, sent by Lionel de Rothschild, Esq., as a hardy flowering plant for the woodland garden. Trusses spherical, of about fifteen widely funnel-shaped flowers with wavy margins, clear bright pink with a tinge of salmon, speckled darker within. Leaves variable, widely ovate to oblong-oblanceolate, obtuse, apex often recurved and constricted at the midrib, the wider leaves often nearly palmately veined, bright green above, fugaceous brown-tomentose beneath.

Rhododendron Maddenii. A.M. June 21, 1938, as a hardy flowering shrub for general garden use. Shown by Lt.-Col. E. H. W. Bolitho. A fine specimen with up to six white flowers in a truss, greenish within the tube, was shown. The buds were greenish-yellow, slightly flushed deep rose.

Rhododendron polyandrum, Pink var. A.M. June 8, 1938. Exhibited by Lt.-Col. L. C. R. Messel as a hardy flowering shrub. This variety differs from the buff or creamy-white variety, which received **A.M.** in 1933 (see JOURNAL R.H.S., **59**, xxxviii), only in its rose-pink flowers.

BOOK REVIEWS.

"Herbaceous Borders and the Waterside." By R. Sudell. 8vo. 303 pp. (English Univ. Press, London, 1938.) 12*s.* 6*d.*

We learn from the Introduction that the "book is written as a guide to those who want to know more about Herbaceous plants," and that "the best-known methods of cultivation" are described—one would rather have seen "the best." However, the chapter devoted to cultivation generally is excellent, and so too are those for which Mr. Perry is responsible, on water and bog plants, although the divisions overlap.

It would be easy to find faults in various other parts of the book, *e.g.* it would not be easy to name "many perennials" which are "deliciously scented"—and we find no list of them in Chapter IX. Pancratiums and Polianthes are not good perennials, nor would we put *Helleborus niger* in the border—it is a shade plant; and so on. And why omit Bocconia, Rudbeckia, Helianthus, Crambe, Rheum from a list of plants for bold effect? The figure labelled *Heliopsis scabra incomparabilis* (p. 113) is certainly not that plant.

Though we draw attention to these points it is not to be thought that the book is "scintillating with errors." On the contrary it is not, but is a useful addition to the books dealing with herbaceous perennials.

"Alpine House Culture for Amateurs." By Gwendolyn Anley. 8vo. 188 pp. (Country Life, London, 1938.) 5*s.*

This is a pleasantly written book, full of useful information for the beginner, who, by its aid, should be able to avoid the difficulties and pitfalls which await him. It covers a wide range and deals exhaustively and soundly with all the aspects of cultivation under glass of the hardy plants which are commonly called alpines. Whether all the plants enumerated in the extensive lists are true alpines or not I will leave to personal judgment.

After a foreword by the veteran Mr. G. P. Baker, follows an introduction very charmingly expressed. There are ten chapters dealing successively with the alpine house, frames and shelters, potting shed, propagation, potting and watering, routine, pests, exhibiting and collecting. Mrs. Anley writes mainly for Great Britain, and rightly says that our methods would not succeed in the Eastern U.S.A. True, but what about cultivation in Sphagnum? Chapter VIII, the Scree Frame, is a comparatively new venture. I had the privilege of inspecting these frames and am impressed by the possibilities. A slight modification, a deeply dug centre gangway, would add to the comfort of the worker, but also increase the cost.

There is a chapter on dwarf and slow-growing conifers, which makes me doubtful whether their cult is not overdone. Let us admit, perhaps, dwarf seedling forms, but beware of pathological cases like *Pinus Beauvrenensis*, a diseased form of the Scots Fir, probably a witches' broom.

The chapter on Insect Pests caused a restless night. Is life worth living with all these hosts about? Up, early in the morning, to look for Aphides on Androsace by the help of a powerful lens. Thanks, kindly Fate, all clear! But behold, what do I spy with my naked eye? The ravage of the White Fly, not mentioned amongst the despoilers, but frequently met where neighbours grow tomatos. Cyanide is the only chemical remedy, but not feasible near a dwelling house, not even with gas masks. The alternative is the White Fly Parasite, so kindly provided by our friends at Wisley, which unfortunately prefers the buoyant atmosphere of a greenhouse and is not as hardy as the host. Beware of the pest complex!

Little fault can be found with methods of cultivation, but the steel transplanting tool sounds a formidable instrument. The homely hard-wood skewer as supplied by our butcher or fishmonger, pointed one end and flattened on the other, provides by far the best implement for transplanting seedlings, which need never be touched by hand. Green celluloid labels, cut from sheets to size, are neat, clean and most enduring and cheap in the long run. The authoress should have stressed more the importance of careful crocking, which is so often carelessly done. It is probable that more pot-grown alpines die from faulty

crocking than from any other cause, including overwatering. Peat, in my experience, is the best plunging material, pots come out clean, it does not attract worms, and after a year or so the peat moss is in fine condition for potting. There is no waste. Of all surface dressing material granite seems to attract moss and Marchantia less than any other.

Half the volume is given to long lists of plants to grow, which must be bewildering for the beginner, for name, colour and flowering period only are mentioned. There are some useful hints on cultivation, and Mrs. Anley was wise to enlist the help of specialists for some of the more difficult genera. She should have done it for Orchids. The publication quoted is only available to a limited number and the paper, at the best, only suggestive. I suppose a list, What not to grow, would have made the book too bulky. Mrs. Anley would readily admit that a large number of the species mentioned would do just as well or better in the alpine garden. *Oxalis hirta*, when covered with a bell glass, readily opens its pretty flower.

The proof reading was carefully done, and there are relatively few mistakes. We believe that the Primula figuring in catalogues as *Rheiniana* should really be spelt *Rhenania* = Rhineland, probably an Arends hybrid and of *marginata* blood. There is a number of small but good illustrations.

The prospective buyer will find the volume a very good investment. It is the first book of its type, and will probably remain a standard work for a long time.

P. ROSENHEIM.

"Hardy Bulbs. Including Half-hardy Bulbs and Tuberous- and Fibrous-Rooted Plants." By Lt.-Col. C. H. Grey, D.S.O., F.L.S. Illustrated by Cecily Grey. 8vo. viii + 368 pp. Vol. II. Amaryllidaceae, Commelinaceae, Haemodoraceae, Orchidaceae, Scitamineae. (Williams & Norgate, London, 1938.) 30*s*.

Within six months of the appearance of the first (*see* p. 248), we welcome the arrival of the second part of this important publication. Again we admire the industry and painstaking labour and again we regret the relative insufficiency of cultural information. More than 130 genera are described, but we doubt whether more than 25 per cent. are cultivated in private gardens, and for this reason the work should have a stimulating effect on the curious gardener.

While the temperature of a cold house can be definitely approximated, Col. Grey's cool house appears to enjoy a comfortable flexibility, otherwise he would not be able to grow a number of the species mentioned. We have no practical experience of many of the genera included in this volume, which contains perhaps many doubtfully hardy species. Climatic conditions vary from county to county and a good few are for the West Country only. It is difficult to appraise the garden value of some of the species, while others with a fair garden record appear to have been omitted. But these are small details. Some of the plants seem to have gone out of fashion like *Bravoa geminiflora*, which is rarely seen nowadays. *Tecophilaea violaeflora* (= *violacea*) has been listed by one Dutch firm for several years. We would like to warn gardeners on light soil not to grow Tradescantia nor *Commelina coelestis* near valuable plants because of their seeding propensities.

By far the greatest part is taken up by the description of Orchidaceous plants, which have never become popular, mainly for the lack of cultural directions and the insufficiency of supply. We believe that Col. Grey's statement "that it is courting failure to attempt to move any orchid except in the dormant state" requires qualification. Our own experience with Orchis, Ophrys and a few other tuberous genera tells us that collected roots move best at the moment when the flower spike begins to die down and far better results were obtained with collections made during the flowering period, than in November, when bulb orders are executed and orchid tubers arrive with shoots half an inch long. We also believe that lime-loving species can be quite accommodating without it, and we flowered this year a few *Ophrys lutea* in a granite scree which were collected in Greece in 1936 when in full flower. We would welcome a paper by the author on the mystery of hardy orchid seed sowing, as many people are sceptical about success. We are authoritatively informed that hardy Cypripedium species have never been raised in this country from home-grown seed. Tubers will sometimes rest a year or so, and growers should not be disheartened by the temporary absence of life.

Proof reading appears to have been carefully done, and we prefer again the plates without background.

P. ROSENHEIM.

"Gardens and Gardening, 1938: Plans and Lay-out." Ed. by F. A. Mercer. 4to. 132 pp. (Studio, London, 1938.) 10*s.* 6*d.*

The main theme of this issue of the Studio Year-book of Gardening is the planning of the garden, and the chapters include Planning and Replanning the Garden, Plans by leading Garden Architects, Colour in the Garden, Pools, Ponds and Streams, and how to use them, and Rocks, their meaning and use in Japanese Gardens. The illustrations in black and white are, as usual, excellent, and the two coloured illustrations are better than one often sees, though somewhat gloomy.

"Modern Fruit Growing." By W. P. Seabrook. Ed. 5. 8vo. xi + 327 pp. (Benn, London, 1936.) 7*s.* 6*d.*

The most useful book for the commercial fruit grower has been revised to include accounts of the newer mechanical devices for carrying on orchard work, and the chapter on cordons (which are for certain purposes commended) has been re-written. A feature of the book is the clear statement of costs which so many books omit.

"Die Rose als Objekt der Zuchtung." By Dr. H. v. Rathlef. 8vo. 82 pp. (Fischer, Jena, 1937.) R.M. 4.50. Paper covers.

Considerable attention has been given to the genetic composition of Rose species of late, and this new book will provide a useful summary of what has been done and many suggestions for future workers with the Rose. An introduction deals with plant-breeding in general and gives, among other things, a list of characters which have been found to be dominant in the rose, both as regards form and such characters as mildew-resistance (which is recessive). Other chapters deal with fertility and sterility, and with pollen quality in cultivated roses.

After consideration of various types of Chromosome combination, an alphabetical list of species and of some cultivated varieties with the numbers of chromosomes possessed by each (7 being the basic number), and in many instances the percentage of pollen germination occupies 16 pages, and a bibliography completes what should prove a very useful book.

"Plants for the Connoisseur." By Thomas Hay, M.V.O., V.M.H. 8vo. xi + 180 pp. (Putnam, London, 1938.) 10*s.* 6*d.*

For many years Mr. T. Hay has contributed notes to various journals on new and forgotten plants, and in collecting them under one cover in a convenient form he has wisely made them accessible to a wider circle of readers. Few of his generation have worked so assiduously or with a greater measure of success in the cause of plant introduction and re-introduction as the Superintendent of the London Central Parks.

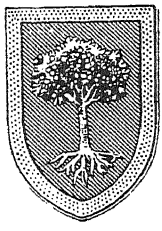
His collection of annual and perennial plants for the connoisseur numbers upwards of one hundred species and varieties. It includes hardy and half-hardy plants, and, though it is not to be supposed that they are all for every connoisseur, experts in the various genera which are represented will find much to interest them in the volume.

In his preface Mr. Hay discloses to some extent how he became interested in the idea of re-introducing plants which had been in cultivation years ago but had long since been lost, and it was only one step further to try to introduce some of the plants which had been known to the botanist as herbarium specimens for many years but had never been in cultivation in this country. His wide knowledge of plants and of horticultural literature was of great assistance to him, but how to obtain seeds of the plants he wanted was the problem he had to face. It required all his ingenuity and skill to convey to possible collectors in far-off countries a correct idea of the particular plant for which he was looking, and of the locality where it was likely to be found. It would have been interesting had he found it possible to give a fuller account of the search for the seeds of some of the plants he describes.

The influential assistance which he received, and to which he pays a high tribute, undoubtedly enabled him to succeed in many of his efforts, but the fact remains that he has introduced or re-introduced to our gardens many plants of great merit.

The book is unusually rich in illustrations; they represent about one-third of the pages devoted to the letterpress, and the photographs are on a high level of technical skill.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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FORTHCOMING EVENTS.

THERE will be no Autumn Show this year owing to the impossibility of obtaining accommodation suitable for the purpose. However, it is hoped the Fellows will make the best of their opportunities at the Fortnightly Shows in September and October. On these occasions, although the exhibits may not be quite so large, there will be fine groups of autumn flowers and of trees and shrubs with their coloured foliage and berries. There will also be, without doubt, a large number of novelties and new introductions submitted to the Society's Committees.

For the dates and times the Fellows are referred to the Calendar given below. Attention is especially drawn to the Show of the National Chrysanthemum Society on September 20 (1 to 8 P.M.) and September 21 (10 A.M. to 5 P.M.) when early-flowering Chrysanthemums will be exhibited. Although this Show will not be found on the Fellows' tickets it will be open to Fellows of the Society on showing their tickets.

In connexion with the early-flowering Chrysanthemums an interesting trial of the best varieties of these plants is at present going on at the Society's Gardens at Wisley which should be of interest to all those who appreciate the value of these flowers (see p. 409).

On September 13 (12 noon to 7.30 P.M.) and September 14 (10 A.M. to 5 P.M.) a Fortnightly Show will be held, and on this occasion a silver trophy, provided from Mrs. Sherman Hoyt's Prize Fund, is offered for the best group of cacti and/or succulents staged by an amateur. Entries must be made on special forms obtainable from the Secretary, to whom the completed forms must be returned not later than by the first post on Wednesday, September 7.

At 3.30 P.M. on September 13 Mr. J. M. S. POTTER will lecture on "Plums."

The London Gardens Society's Show will be held in the New Hall on September 16 (2.30 to 9 P.M.) and September 17 (10 A.M. to 6.30 P.M.).

The practical examination for the British Floral Art Diploma will be held on Wednesday and Thursday, September 28 and 29, in the Town Hall, Torquay.

A Fortnightly Show will be held on September 27 (12 noon to 7.30 P.M.) and September 28 (10 A.M. to 5 P.M.).

Mr. E. A. BOWLES will lecture on "Flowers in Season" at 3.30 P.M. on September 27 in the Lecture Room of the New Hall.

Entries for the Fruit and Vegetable Show to be held on October 11 and 12 must be received by the Secretary not later than by the first post on Tuesday, October 4.

A Fortnightly Show will be held on October 11 (12 noon to 7.30 P.M.) and October 12 (10 A.M. to 4 P.M.) in the New Hall.

In the Old Hall on October 11 (1 to 7.30 P.M.) and October 12 (10 A.M. to 4 P.M.) the Fruit and Vegetable Show will be held. At this Show there will be a special exhibit from Wisley of Pests and Diseases of Fruit and Vegetables. The schedules can be obtained from the Secretary.

At 3.30 P.M. on October 11 a lecture on "Thirty Years an Exhibitor, and Advice to Young Exhibitors" will be given by Mr. A. E. USHER.

A Fortnightly Show will take place on October 25 (12 noon to 7.30 P.M.) and October 26 (10 A.M. to 4 P.M.). It is usual on this occasion to find Berried Shrubs, Orchids, Stove and Greenhouse Plants well represented.

The following Orchid competitions will take place for Trophies presented by the Orchid Trade:

(*a*) A Silver Trophy for the best twelve Orchids, not more than two of any one genus, exhibited by an amateur who employs not more than two growers, including the head gardener, in his orchid houses.

(*b*) A Silver Trophy for the best six Orchids exhibited by an amateur who employs not more than one orchid grower or gardener.

Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than by the first post on Wednesday, October 19.

At 3.30 P.M. on October 25 the first of the Masters Memorial Lectures for 1938 will be given by Mr. F. J. CHITTENDEN, F.L.S., V.M.H., on "The Behaviour of Plants." The second lecture will be given on November 8.

These Masters lectures are the outcome of a fund subscribed to commemorate Dr. MASTERS, who was for a very long period associated

with the Society, Chairman of the Scientific Committee, and for long connected with the Lindley Library of which the Society is Trustee.

A Lily Group discussion will take place at 4.30 P.M. in the Restaurant of the Old Hall on October 25 on " Raising Lilies from Seed."

The Presidential Address of the Institute of Landscape Architects will be given at 3 P.M. on October 26 in the Lecture Room of the New Hall. Fellows interested are invited to attend.

Fellows are warned that Fellows' tickets will not admit to the National Chrysanthemum Society's Show on November 3 (1 to 7.30 P.M.) and November 4 (10 A.M. to 5 P.M.).

PUBLICATIONS.

Flowering Trees and Shrubs.—The Report of the Conference on Flowering Trees and Shrubs is about to be issued in the form of a book entitled Ornamental Flowering Trees and Shrubs. This publication will be available to Fellows at the price of 7*s.* 6*d.* bound, and to non-Fellows at 10*s.* It will form an excellent companion volume to that published this year called Some Good Garden Plants, and it is hoped that its popularity will reach that of the latter book.

HORTICULTURAL COLOUR CHART.

Owing to the amount of work involved in the compilation of the Horticultural Colour Chart it is regretted that it could not be published earlier. The work on the Chart, however, has progressed very favourably, and Volume I will appear at the time of issue of this number of the JOURNAL, or very shortly after. Those who have applied for a copy are being communicated with. No more applications can be received for Volume I at the subscription price of 10*s.*, plus postage, but after publication copies will be obtainable at £1 1*s.* a copy.

FRUIT FOR NAMING.

It is well to remind Fellows that the instructions for sending fruit for naming are as follows :—

> " Send at least three perfect specimens of a variety. Do not send until the fruits are mature and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented-soap boxes taint the fruit and obscure the characteristic flavour. Give all the information you can respecting the age of the trees and how

they are grown, *e.g.* indoors or out, as cordons, bushes, or standards, etc."

It is a convenience if specimens are sent so as to reach the office by the first post on the Monday preceding a Fortnightly Show.

Pictures, Plans, Photographs, Etc.

With the approach of winter space will be available at Fortnightly Shows for pictures and photographs of plants, flowers and gardens, and for plans or models of gardens. Regulations with regard to these exhibits may be had on application to the Secretary. The dates of the Shows when these exhibits are permitted are November 8 and 29, and December 13, 1938, January 10 and 24, and February 7 and 21, 1939.

Horticultural Sundries.

The exhibition of Horticultural Sundries will be allowed at the Fortnightly Shows in December and January. If space is available sundries will also be admitted on November 29.

Hall Lettings.

The London Allotments and Gardens Show Society will hold a Show in the New Hall on September 3 (2.30 to 8 P.M.). Fellows' tickets admit free.

From September 15 to 24 the Model Engineering Exhibition will be held in the Society's Old Hall. Anyone interested in the exhibition is asked to apply to the organizers, Messrs. P. Marshall & Co., Ltd., 13–16 Fisher Street, London, W.C. 1, for full particulars.

From September 28 to October 1 there will be a Honey Show in the Old Hall. Any Fellow interested in this show is invited to write to the secretary, T. H. Lawrence, Esq., 61 Arthur Road, Wimbledon, S.W. 19, for fuller particulars. Fellows' tickets admit free.

The Civil Service Horticultural Federation will hold a Show of flowers, fruit and vegetables on September 30. Fellows' tickets admit free.

From October 17 to 21 the Medical Exhibition will be held in the New Hall, and interested persons are asked to apply to the organizer, R. S. Ely, Esq., 194–200 Bishopsgate, London, E.C. 2, for particulars.

A Charity Bazaar in aid of the Ladies' Association of Princess Elizabeth of York Hospital for Children is to be held on October 19 and 20 in the Old Hall. Further particulars may be obtained from Miss Hornby, 1 Greycoat House, Greycoat Place, Westminster, S.W. 1.

Wisley in September.

The first month of autumn brings with it, at least in the earlier part, few signs to be associated with that season, unless the summer

drought is responsible for earlier colouring and leaf-fall than is normal, as may possibly be.

In the part of the garden devoted to the flower trials are a number of showy and useful garden plants representing the latest and best varieties of each kind. Chief of these, perhaps, are the Dahlias, of which the long double border leading up towards Battleston Hill has this year been slightly extended and now contains about two hundred and seventy varieties; Asters, including both the perennial *Aster Amellus*, *A. novae-angliae* and *A. novi-belgii* varieties, as well as the annual type more properly called Callistephus; *Lobelia cardinalis* and *Scabiosa caucasica* are also on trial this season, and although the last have been in flower since the end of July they are still likely to be producing many of their charming blue, lavender or white flowers. The early-flowering Chrysanthemums should this month attain their height. The trial includes two hundred and thirty-two varieties. The Roses on each side of the long walk traversing the hillside are in their second period of blooming, which, it is to be hoped, will not be shortened like that in July by dry weather.

It is the end of the year so far as the Alpine house is concerned, but there may well be varieties of Campanulas, Wahlenbergias, and Gentians, as well as the pretty little *Oxalis lobata* and the orange berries of *Nertera depressa* to reward those who pay a visit here.

On the Rock Garden several species of Cyananthus, Gentiana (including *Gentiana ornata*, *G. Veitchiorum*, and the fine hybrid 'Devonhall') with such plants as *Polygonum vaccinifolium*, *Zauschneria californica* with its bright scarlet tubular blossoms, *Cautleya spicata*, *Roscoea purpurea pallida*, and the best double form of the Ling, *Calluna vulgaris* 'H. E. Beale' decorate their chosen sites, but no doubt other flowers of merit will be found by interested searchers.

In the Wild Garden the Willow Gentian carries its long sprays of rich blue trumpets and the pink or white blooms of *Cyclamen neapolitanum* appear before the foliage. Of shrubs mention must be made of the uncommon *Cyrilla racemiflora*, a native of the south-eastern U.S.A., forming a bush four or five feet in height which bears late in the season pendent racemes of white flowers. *Hydrangea paniculata grandiflora* is another with dense creamy terminal panicles, and *Hoheria populnea* from New Zealand, whilst *Tropaeolum speciosum*, the scarlet 'Flame Flower,' scrambles over the Azaleas in all directions, and is also to be seen on the east wall of the keeper's house by the entrance gates.

Amongst the Heathers in Seven Acres the most attractive now are the many forms of the common Ling, particularly *Calluna vulgaris Alportii* in crimson and *Serlei* in white, planted in large masses, but others are to be seen in smaller quantity. Almost equally showy is the hybrid *Erica* × *Watsonii* near the group of Pine trees, the forms of the Cornish (*Erica vagans*) and Dorset (*E. ciliaris*) Heaths and the bright rosy-pink form of the last named 'Dawn.'

The shrubs in Seven Acres are coming to their fruiting stage,

especially some of the Euonymus (*Euonymus latifolius*), Berberis, the weeping *Cotoneaster hybrida pendula*, and *Viburnum betulifolium*, whilst others don autumn tints, notably *Ribes aureum*, which is invariably the first to do so every year, and is closely followed by *Prunus Sargentii*, one of the finest small trees both for this character as well as for the pink flowers in April. One of the few remaining bushes to flower is *Koelreuteria paniculata*, whose pale yellow inflorescences can be seen amongst the Japanese Cherries on the east side of the pond. Along the river bank in Howard's Field some of the large collection of species of Rosa will be found bearing their conspicuous red fruits, especially *R. californica* and the several forms of *R. omeiensis*. On returning an inspection may be made of the herbaceous border, where the Sunflowers, Michaelmas Daisies, Heleniums, Golden Rod, *Lobelia fulgens* and *Anemone japonica* varieties hold sway, to detail only a few of those still flowering.

Beside the Azalea Garden are the Kniphofias, large clumps of the handsome *Crinum Powellii* and its white form, and the long borders of the invaluable *Gentiana sino-ornata*, whilst that most useful grey-foliaged shrub *Perowskia atriplicifolia* flowers in the Award of Merit Garden close by.

In the Temperate house can be seen the double pink form of the Oleander, the pale blue *Plumbago capensis*, and fragrant Stephanotis climbing along one of the roof supports, whilst the first or Half-hardy house contains amongst other suitable occupants the shrubby *Statice rosea*, Oxalis species, and the sweet-scented *Mandevilla suaveolens*, which is native in the Argentine and hardy only in the southern and maritime counties of Britain.

OLD ROSES.

By E. A. BUNYARD, F.L.S.

[Read July 5, 1938; The Hon. ROBERT JAMES in the Chair.]

THE great interest now shown in the old Roses is an encouraging sign that flower lovers, in general, refuse to accept any standardizing of their tastes.

There are indeed some Rose enthusiasts who refuse to see any beauty of form save in the long pointed bud of the Hybrid Tea Rose of to-day, just as the ideal of beauty for their grandparents was the buxom Hybrid Perpetual. Everything in those days tended to the buxom; furniture, feminine figures and flowers: such were the canons of mid-Victorian taste.

Some of us, however, fail to see why there should be but one standard of beauty for the Rose, or for that matter, any other flower. If we admire a Poet's Daffodil, must we despise a Cyclamineus? If the incurved bloom of a Trollius is lovely, why not the same form in the Rose? Those who preserve the old Roses are, besides ministering to their own enjoyment, preserving for gardens in general the forms and colours which gave delight to a past generation and which may equally do so to a future one.

Some happy Rosarians can find beauty in both ancient and modern forms and colours, and in both there are, of course, the good, and others less good.

As I have given a short résumé of the history of the Rose and especially those groups which we know as 'Old Roses' in my recent book Old Garden Roses (Country Life), I propose here to deal with them more particularly as garden plants and to add some notes to help in their identification.

One of the first questions we ask of an unknown plant is the height it naturally attains. In Roses it is difficult to answer this very definitely as by pruning we can keep a plant in a dwarf form or by allowing it to grow at large the same plant may attain many feet in height and width. Our "dwarf" H.T.'s are now grown in some gardens unpruned and thus reach some 6 feet or more in height.

When pruning is abandoned growth begins again at the end of last year's wood. If the plant makes 3 feet in the first year, it will probably make 2 or 3 feet on the top of the unpruned shoot next year and so on. By pruning back hard each year, as we do in our dwarf H.T.'s, we merely repeat the first year's growth again from the base and we call this plant a dwarf, but it is only an artificial dwarf produced by pruning. A natural dwarf makes a few inches each year—there are but few of these among the old Roses and I have suggested that where

the flower and leaf are of normal size but the annual growth very short this is a true dwarf.

Where leaf and flower are much reduced in size from the normal, as 'Spong' in the Cabbage Roses and 'Rouletti' in the China group, I suggest that we call these 'Miniatures.'

Height is therefore determined by the natural growth and the presence or absence of pruning, leaving for the moment the true climbing Roses which make, say, 6 to 10 feet of growth a year, we can group the various families in order of height, thus :

Tallest, 6 to 12 feet.	White Rose. (*R. alba.*)
Medium, 5 to 8 feet.	Damask. (*R. damascena.*)
	Cabbage. (*R. centifolia.*)
Short, 3 to 4 feet.	French Rose. (*R. gallica.*)
Very short, 2 feet.	Miniature of all classes. Some Scots Roses.

Rosa alba.

These give us the strongest growing of the old garden Roses and were in fact known as 'Tree' Roses in the last century.

Their place in the garden is therefore at the back of the border in woodland glades, or as climbers on walls.

Among the hardiest of all Roses, they thrive in the northern climates of our country and, not minding shade, on north or east walls.

Their great vigour enables them to look after themselves in places where the roots of other trees penetrate and the check to their growth is in fact an advantage, tending to more flower and less growth.

If left unpruned the strong branches will become bare and look rather coarse. It is well to cut back to 1 foot or so all branches three years old and over in order to get fresh growth from below and flowers at eye and nose level.

In most soils manure is not required but, like all Roses, an occasional sprinkle of potash and phosphatic manure will be repaid by better health and quantity of flower.

All this group can be trained up pillars and pergolas, but as their flowers are held upright they are better seen on walls or as bushes; they should be looked "into" rather than "up at."

The Italian painters have shown us the way to see them at their best by training them on low trellises bounding the small gardens of those days. All the Renaissance paintings that I have seen show *R. alba* thus used and never the darker and dwarfer *R. gallica* which from its low growth would obviously have been unsuitable.

Lovely as the flowers are, this Rose is always welcome to the eye on account of its fine silvery foliage which firmly resists black spot, mildew and such disfigurements. The scent is distinctive, having an Eau-de-Cologne sharpness, quite different from the Cabbage and Damask scents.

The pure white varieties we have to-day are as follows : Semi-double, double white, and large double white, and the small 'Pompon

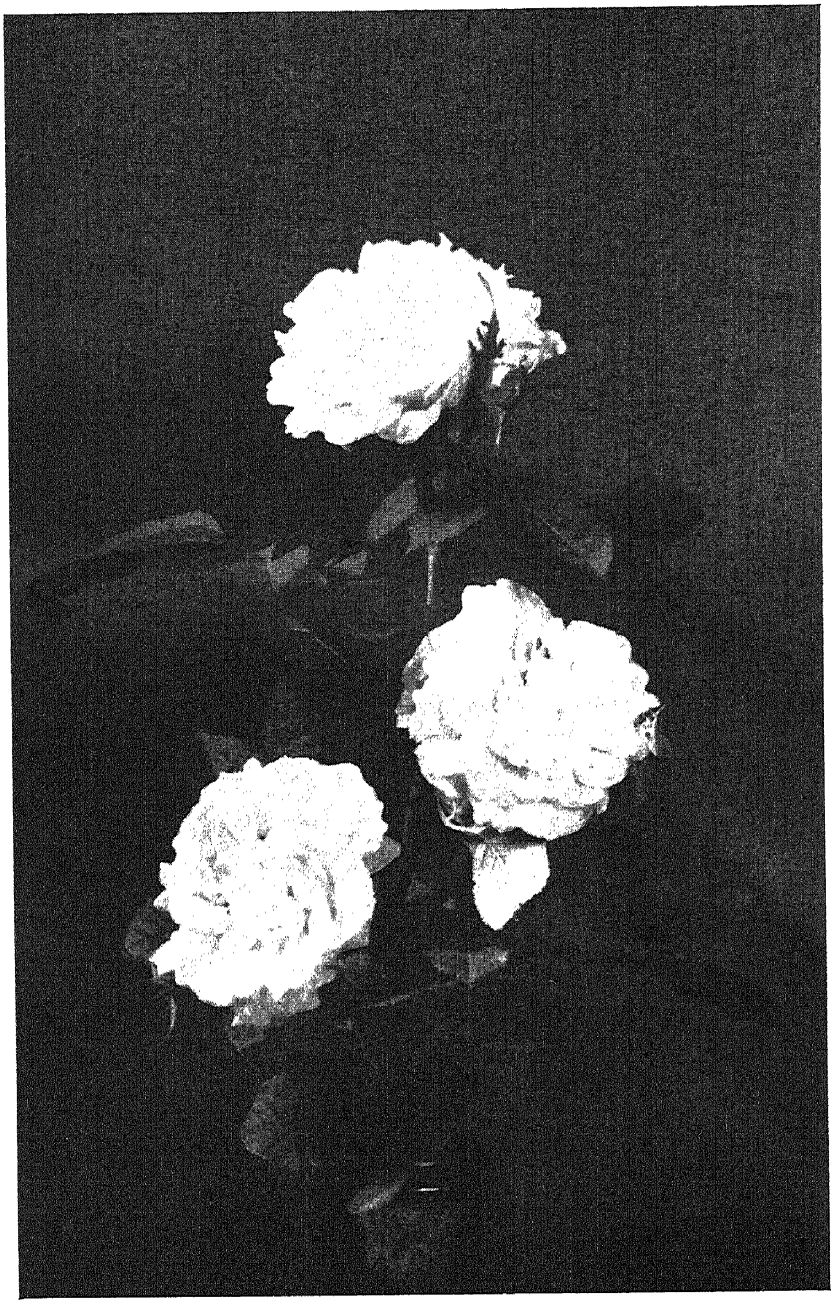


FIG. 107.—ROSE 'MAIDEN'S BLUSH.'

[*To face p.* 412.

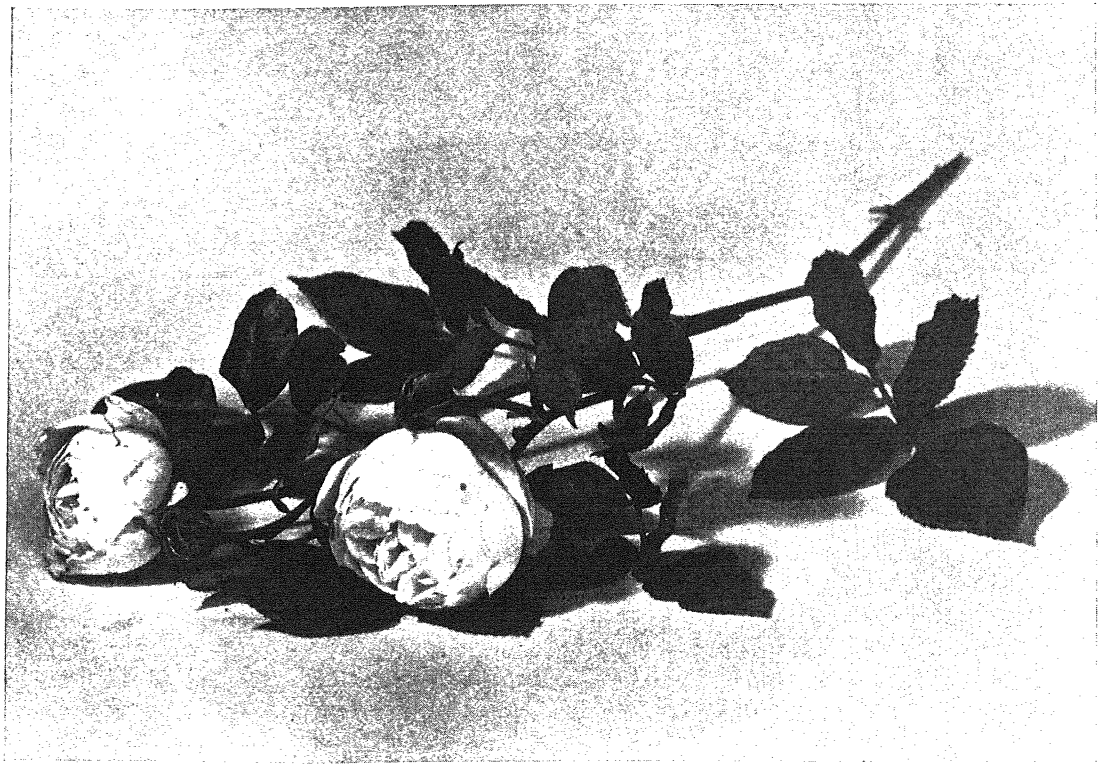


FIG. 108.—ROSE 'MME. PIERRE OGER.'

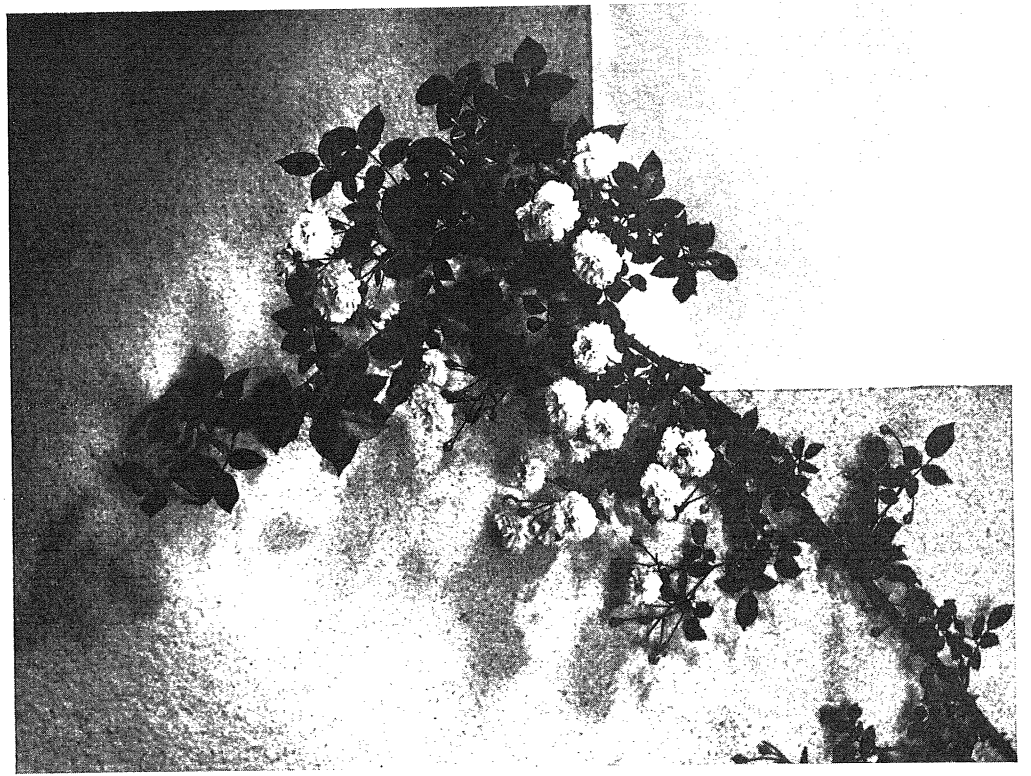


FIG. 109.—ROSE 'FÉLICITÉ ET PERPÉTUE.'

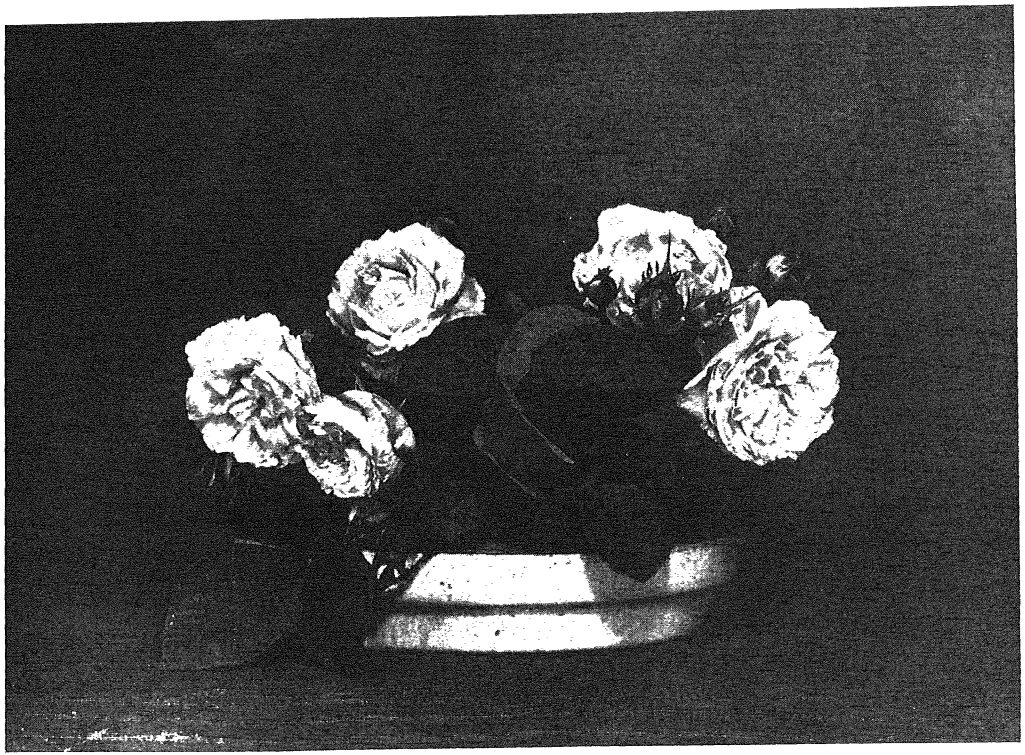


FIG. 110.—ROSE 'VILLAGE MAID.'

[*To face p.* 413.

Parfait.' The first three are of great antiquity and can be found in the Herbals of the sixteenth century and in the works of early Italian painters such as Botticelli and Crivelli.

Of the pink varieties our ' Maiden's Blush ' (fig. 107) is best known and there is also the large ' Maiden's Blush ' which I think I have now recovered.

The semi-double ' Celestial ' is certainly one of the most lovely of all pink semi-double Roses and can be distinguished from the others by its cupped leaves and the curious metallic sheen of these when quite young.

The Ayrshire Roses.

It is now a little difficult to draw a line between these and the Evergreen varieties, and there are few in catalogues to-day. They are very robust and long-lived and as the descendants of a native Rose (*R. arvensis*) they make the best of our climate.

' Dundee Rambler,' double white, and ' Bennetts' Seedling ' are sometimes seen in gardens and probably a good many more lurk unsuspected.

I should like to find ' Splendens,' a pale pink, buds crimson before opening and smelling of Myrrh.

The Bourbon Roses.

These take their name from the Island of Bourbon (now Reunion) and are most probably a China-Damask cross.

They retain the perpetual flowering of the China Rose and its distinct foliage.

The best two are ' Mme. Pierre Oger ' (fig. 108), a dainty shell-petalled flower of Cabbage style, pale pink but deeper in the sun, showing the China character in this respect, and ' Louise Odier,' lilac-pink, of the same form and equally well scented.

Both have the valuable character of not allowing their petals to fall when dying; they quickly close up and so remain, a joy to those to whose care the vases are entrusted.

Two other old varieties, now nearly centenarians, are ' Coupe d'Hébé ' and ' Blairi No. 2.'

These are more of the H.P. style, both are rose-pink, very fragrant, and should be allowed to make free bushes when they will attain 6 feet or so.

' Mme. Ernest Calvat ' must be counted one of the moderns, having been introduced in 1888, but it has an old-fashioned air and indeed is one of the most distinct of all garden Roses. At first glance it is often taken for a Tree Paeony. The large flowers, not very double, have the silky texture of the Paeony and the dark claret foliage helps the illusion.

The general foliage effect of the Bourbons is well seen in the best known variety of to-day, ' Zéphirine Drouhin,' an oldish Rose (1868) rescued from oblivion by the seeing eye of Miss Jekyll. The curious

milky-green and the claret tinge on the young growth are, as far as I know, quite distinct marks of the Bourbon Rose.

All of them are admirable for large bushes for pillars but not, I think, for hot walls. Red Spider and the ever-present Leaf Hopper damage the foliage in many seasons. All should be boldly pruned to get strong shoots from below.

The Boursault Roses.

These are the offspring of the Alpine Rose (*R. pendulina*) and the China Rose (*R. chinensis*) and once famous, but they are now seldom found in gardens.

I have, in the last two years, found one or two varieties, and 'Elegans' is semi-double, purplish-red and showing a white stripe in the petal.

The 'Blush Boursault' is the second variety now available and here the flowers are larger than 'Elegans' and blush-pink, very attractive and free in flowering.

No Roses do better in town gardens and it is to be hoped that Rose hybridizers will again turn their attention to this very distinct group.

The strong shoots are thornless, or nearly so, like the parent 'Alpina' and the leaves very distinct. In winter the shoots might very well be taken for Raspberry canes.

The Cabbage Roses (*R. centifolia*).

The Cabbage Roses are the largest and most fully petalled of all the old Roses and received their not very pleasing name from the shape of the flowers, the incurving petals overlapping as in the Cabbage.

Since their arrival in Northern Europe at the end of the sixteenth century they have won a favoured place in gardeners' hearts, first for the scent and secondly for their noble and massive contours so appropriate to the seventeenth century. We may indeed think of them as the Rubens among Roses.

Of the large number grown in the early nineteenth century we have now but few, but those that remain are fortunately the classics of their race.

The original Cabbage Rose, beloved by the Dutch flower painters, still remains, as do its sub-varieties 'Prolifera,' which bears a bud in the centre of its flowers, a Rose in Rose, and the remarkable 'Cabbage-leaved,' whose large leaves are crisped and curled in the best Cabbage Lettuce style.

'The Crested Cabbage,' often wrongly called 'Crested Moss,' is remarkable for the winged edges of its sepals. This was formerly known as the 'Chapeau de Napoléon,' a suggestion which is easily recognized before the bud opens.

A group with smaller flowers and growth is worth a place in any garden of Old Roses—'Duc d'Angoulême,' a pale pink anemone-shaped

flower, ' Duchess de Montebello ' in the same manner, ' Anais Ségalas ' remarkable in that the lilac rose petals are contributed in the manner of a Zinnia and a very distinct and charming variety.

The White Cabbage Rose known as ' Unique ' still stands alone to-day as it did on its introduction in 1775. It is large and pure white, save for a flake or two of red on the outside petals, faintly scented. The large leaves are very striking when young by reason of the brownish-red tints they then possess. Growth moderate.

All this group make fairly large bushes and respond to manure and fairly hard pruning. But, as many an old garden shows, neglect does not discourage them and it is for this reason that they have survived so many generations of less hardy successors in the fleeting fashions of the day.

China Roses (*R. chinensis*).

This group is easily distinguished by the characters well known in the Tea Rose—pointed leaflets, often a little undulating at their edges; wood usually red, with thorns and no bristles; a dwarfish habit generally and where the flowers are pink or red they get darker as they grow older, unlike the Cabbage Roses which get lighter in colour. There are miniatures in this family of which ' Rouletti,' which will be found under the heading of Miniature Roses, is best known to-day.

The oldest is our still-favoured ' Blush China,' which can be traced in Chinese pictures a thousand years back. ' Hermosa ' is a modern edition dating from 1840. The two are often confused, but the ' Blush China ' has a loose open flower and ' Hermosa ' has many more petals like a small Cabbage Rose. One of the most beautiful is the dark crimson ' Semperflorens,' beautifully illustrated in Miss Willmott's Genus Rosa, p. 89. The cupped flowers, dainty foliage and general look of distinction make this one of the most attractive of all the China Roses and I am glad to have found it, after long search, at Nymans, the home of so many rare and lovely Roses.

The ' Crimson China ' is a larger form of this.

Another remarkable variety is ' Lemesle,' also known as ' Vesuvius.' The flowers are the size of the common China, the outer petals dark crimson and when opening the centre petals are blush-pink. As they expand they gradually turn a pale crimson like the outer petals, an interesting example of this habit, possessed only, so far as I know, by the China Rose.

Resembling this in size and colour of flower is the curious ' Serratipetala.' The petals are cut at the edges and fluted with pink and white when grown outdoors. This makes a large spreading bush, quite different in habit from the type of China Rose.

' Chinensis purpurea ' is the darkest of all, often reaching plum colour, and is semi-double.

Among the singles is ' Miss Lowe,' probably the old single ' Red Chinensis.' This is also figured in Miss Willmott's book.

Finally we must add the remarkable variety known as 'Tipo Idèale' and also as *R. turkestanica* and *R. mutabilis*. Its varying tones of pink, rose, red and buff in its single flowers account for the 'Mutabilis' but the 'Turkestanica' is, I imagine, a geographical error; it is obviously a China Rose.

Evergreen Roses (*R. sempervirens*).

Of the Evergreen Roses the best known is the old 'Félicité et Perpétue' (fig. 109) which was named after the two Carthaginian Martyrs, St. Félicitas and St. Perpetua.

This bears clusters of faint blush flowers fading to white and of the most perfect petal arrangement. The smaller central petals lie back in the large ones and produce a true imbrication. As the leaves are almost evergreen there is nothing better for covering a screen or trellis or to run over an arbour if such exists to-day.

'Little Pet' is a dwarf edition of this old favourite and makes a neat cushion of 18 inches, save for an occasional ambitious shoot which wishes to climb and must be removed. Not less beautiful is 'Adélaide d'Orleans,' raised by M. Jacques, gardener to the Duke of Orleans and introduced in 1829. The flowers are the same colour as 'Félicité' but loose and excellent for a pergola as the flowers hang downwards.

Both of the above are admirable for climbing up old trees but for 'Félicité' they must not be too old as the great weight of branches in ten years' time will need substantial support.

The Gallica Roses (*R. gallica*).

Taking this group and excluding for the moment the striped ones, the type is the 'Red Gallica' which is our 'Rosa Mundi' in the striped form.

I have noticed that 'Rosa Mundi,' when on its own roots, produces the unstriped flowers on shoots which come direct from the roots, so it is evidently a chimera.

The name 'Red Gallica' is a little inaccurate as it is a bright rose—Tyrian rose to be exact. This was long known as the 'Red Damask' but this is obviously wrong, as its short stature, 3 to 4 feet, its round—not elongated—hip, and the foliage all proclaim it a 'Gallica' pure and nearly simple. The 'Apothecary's Rose' is very double, medium, rose-pink fading paler at the edge of the petals, a neat flat little flower and an equally neat dwarf plant. This name has been disputed and some would have it that the true old 'Apothecary's Rose' is the 'Red Gallica' named above. As the name is now so well established for the double variety it is perhaps best to leave it and remember that all Roses at one time were subject to the apothecary for various healing medicines.

Perhaps the most striking of this group is the well-known 'Tuscany,' whose colour might well be matched with the Chianti of that country. The flowers are semi-double. A good semi-double variety is known as

'Gallica Splendens,' the flowers are a deep rose with a hint of scarlet and are followed by a profusion of bold red hips. A hardy variety which will hold its own in shade and on the driest of soils.

All of this group and the striped ones as well should be pruned after flowering and so no scruples need be felt in gathering them freely for decoration. They quickly make new wood in July and from this better flowers will come than from unpruned bushes.

However treated the Gallica Roses refuse to give way to neglect, and often a bush growing in a neglected spot will be found to mark the site of a destroyed cottage. Its free-seeding quality has made it spread widely on the Continent, even as a weed in cornfields, and thus it has been considered as a native of Europe, but I think this very doubtful, despite the authority of many botanists for a century or two.

The striped Gallicas are best known by the well-known 'Rosa Mundi' and we may presume that this was the parent of them all. As later on they were crossed with the Centifolias or Cabbage Roses we find two groups, those with the flat Gallica flowers and those with more globular ones resembling the typical Cabbage Roses.

Taking the Gallica class first we have 'Tricolor de Flandre,' a little more double than 'Rosa Mundi,' with broad and narrow purplish-red stripes and of Camellia-like form, a most striking variety. 'Panachée Double' resembles it but is darker, the darkest of this group I have yet found. 'Panachée de Luxembourg' is a deep crimson and though I condemned it in my Old Garden Roses I find since then it must be reprieved as it greatly improved as the bush grew older.

'Georges Vibert' is a Carnation-like flower, much smaller than the above, pale pink, with darker but not broad stripes. This makes a neat dwarf bush of true Gallica proportions.

'Belle des Jardins' is a purplish-crimson, only faintly striped, but it must come into this group and will please those who like this colour.

'Oeillet Flamand' as its name suggests is another Carnation-like flower, lilac-rose striped with lighter colour. This name I advance with some hesitation as in olden days three Roses bore it, a fact by no means unique among the old Roses, and there is obviously a great difficulty in verifying such names, especially when no good descriptions or pictures are to be found.

Turning to the Striped Roses of Cabbage forms the old 'Village Maid' (fig. 110) is typical. The large pale pink flowers are lightly striped with rose. This is usually the first of its group to flower and continues for a long time.

'Perle des Panachées' has almost the shape of an H.P.; the stripes are broad but not numerous, rose-pink or pale, almost creamy-white, a very effective combination. 'Commandant Beaurepaire' is more cupped in form, brilliant carmine with darker stripes and the reverse of petals pink with darker stripes, the only striped Rose I know which shows this character.

'Panachée Double' is a dark lilac-purple with white stripings, the most distinct of all by its very small amount of striping. 'Dometille

Beccard ' is very near to ' Village Maid ' if we have it correctly named, but so far I have to keep a query after this name.

All these striped Roses benefit by good cultivation and vigorous pruning; in fact the same generous treatment we give the modern Rose, if we are to have them at their best.

Miniature Roses.

The Miniature Gallica known as the ' Burgundy Rose ' is notable for its small dark flowers and its upright compact habit. This is the *R. parvifolia* of many botanical authorities. No Rose pays better for a severe pruning after flowering. It is always willing to break from below and then the plant is kept dwarf and free from the leggy appearance an unpruned bush will develop.

The Miniature China Roses have had a recent renaissance due to the interest of rock gardeners, and some of them are of quite ancient ancestry.

Whether ' Rouletti ' is one of the old Lawranceana varieties or not I cannot pronounce—there were many varieties a century ago.

' Indica Pumila ' and ' Pompon de Paris ' are much alike, having small rose flowers produced throughout the summer. The latter makes a round neat bush but occasionally sends up a strong shoot which over-balances the tree. Such growths must be removed if a dwarf bush is to be preserved.

There are two Miniatures we should like to find again, a Damask ' Bifera Pumila,' illustrated by Redoute—the dwarf ' Pompon de Bordeaux,' a low-growing Cabbage Rose which evidently became a weed by its suckering habits.

Possibly both may yet turn up in some old garden where such things are cherished.

The Noisette Roses.

These result from a cross of the Musk (*R. moschata*) and China Roses (*R. chinensis*), and this valuable group has very distinct characters.

I have never seen the Musk Rose or its descendants showing any trace of mildew or black spot, and as nearly all of this group are autumnal- as well as summer-flowering varieties this quality is of great value.

The first to open is ' Boule de Neige ' (fig. 111), very white and Camellia-like in shape and also in the very solid substance of its petals; tea scented. The foliage is also stout and hard.

Closely following comes the summer-flowering ' Mme. Plantier ' (fig. 112), for some time known provisionally as ' Miss Rhodes.' Here the flowers are pure white and very freely produced. Both of the above can be allowed to grow and ramp as free bushes and in this way show themselves at their best. If pruned as the H.T. for dwarfs they will submit gracefully and fill a place well in a back row.

' Mme. Alfred Carrière ' is usually used on a wall and will do well even facing north or east, but it can also be allowed to grow into a free bush. The very white flowers have at first a blush tinge but finally turn paler.

' Aimée Vibert ' is an old favourite, the double white flowers being produced in clusters right up to the frosts. Admirable for a wall, pillar, or free bush where space allows. All of this group flower throughout the summer and into late autumn except ' Mme. Plantier.'

No Roses are more tolerant of neglect and hard living than the Musks and they are often the last survivors of a neglected garden. Their virtues are shared, it may be stated here, by the modern Musk hybrids of the late Mr. PEMBERTON which have added new colours to this group.

QUEEN OF DENMARK GROUP.

This family was known of old as ' Belgic Roses ' and as so few, I fear, exist to-day, we must group them under the name of their best known representative. Their origin is a matter of guess-work, but I suggest that Alba × Damask may be likely.

I know no old Roses which have more distinction in the garden, aristocrats in every line.

' Queen of Denmark ' is often known by its German name ' Könige von Denmark ' and has been grown in England since 1840.

The flowers are rose-pink, very double with no anthers, leaves rather dark and flat. It makes a bush of medium height about 4 to 5 feet.

Additions to this short list would be very welcome and there were many in cultivation a century ago which it would be most interesting to reintroduce into our gardens.

ANDREWS figures a ' Blush Hip ' and one or two others which evidently belong to this group.

SCOTS ROSES (*R. spinosissima*).

The great day for the Scots Roses was a century or so ago when a hundred or more varieties were raised. Some few of these have come down to us to-day, but lacking good descriptions it is very difficult to be sure as to their names.

This Rose has a wide extension across Northern Europe and Asia and is thus very variable. We have the tall-growing ' Altaica ' down to the very dwarf garden forms, like ' Bicolor Nana ' which does not exceed 2 feet in height.

Colours run from pure white to cream and yellow and from pale rose-pink to a deep purplish-red and to the red of ' William III.'

Many can only be referred to by colour names, lacking their original ones. Of the pure rose-reds ' William III ' is best known. This makes a compact upright bush rather like the ' Burgundy Rose.' The flower is small, semi-double, paler on the outside of the petals.

Of the mottled crimsons—perhaps claret is a better term—'Bicolor Nana' is the dwarfest, reaching only 2 feet. 'Lady Hamilton,' 'Berwick' and 'Staffa' are very much alike. 'Lismore' is to be preferred being more rose-pink. These all make rounded bushes from 3 to 4 feet.

Among the rose-pinks I think *Andrewsii* is the most beautiful of all, a large semi-double, cupped, pale rose-pink lighter in centre. Miss WILLMOTT's illustration in the Genus Rosa (p. 263) shows this lovely Rose to perfection. Another in this section is more upright in growth and is known as 'Double Blush,' this is a cupped flower of medium size.

Whites or more properly pale creams are found in two forms to-day, one a dwarf round bush not more than 2 feet in height and another which makes a tall spreading bush of 6 feet in favourable positions. Both have small cabbage-like flowers.

Of the double yellows I have only found the well-known "small double yellow" in colour very near to the hybrid *Harrisonii*, but there were several large double yellows known a century ago which may perhaps yet turn up in some old garden.

Of the singles I know only the pretty red form grown at Nymans where it makes an admirable small hedge, a single yellow, and of course the dwarf wild form well known to all who golf in Scotland.

Into this group we must place the well-known 'Stanwell Perpetual' (fig. 113), probably a hybrid between a Scots and a Damask, which alone has the quality of flowering the whole summer and autumn and often in the south till Christmas. It has the Damask scent and the habit of *spinosissima*, making a bush of 6 feet or so. For a Rose hedge nothing can be more fitting; pruning does it good, producing stronger growth and therefore larger flowers. It is, in my estimation, worthy of a sheltered place in every garden as I know of no other flowering shrub which will produce scented flowers from May till Christmas, and were I limited to one Rose this would be my unhesitating choice.

SWEET BRIERS (*R. rubiginosa*).

The modern hybrids of this much-loved Rose which Lord PENZANCE raised and introduced in the nineties of the last century are well known to modern gardeners. These are all singles.

Perhaps the most beautiful of all this group are 'Janet's Pride' and 'Hebe's Lip,' both remarkable for the fact that the flowers are edged with rose-pink. 'Janet's Pride' is semi-double, about 2½ inches across, creamy-white edged rose-pink.

'Hebe's Lip' is larger, of the same colour and probably a Damask-Sweet Brier hybrid. The foliage is darker and the flower stalk smooth; in 'Hebe's Lip' it is glandular. This forms an easy method of distinguishing the two varieties.

There were many double forms known a century ago, and recently I have found two of these, both pink.



FIG. 111.—ROSE 'BOULE DE NEIGE.'

[*To face p.* 420.



FIG. 112.—ROSE 'MME. PLANTIER.'



FIG. 113.—STANWELL PERPETUAL.

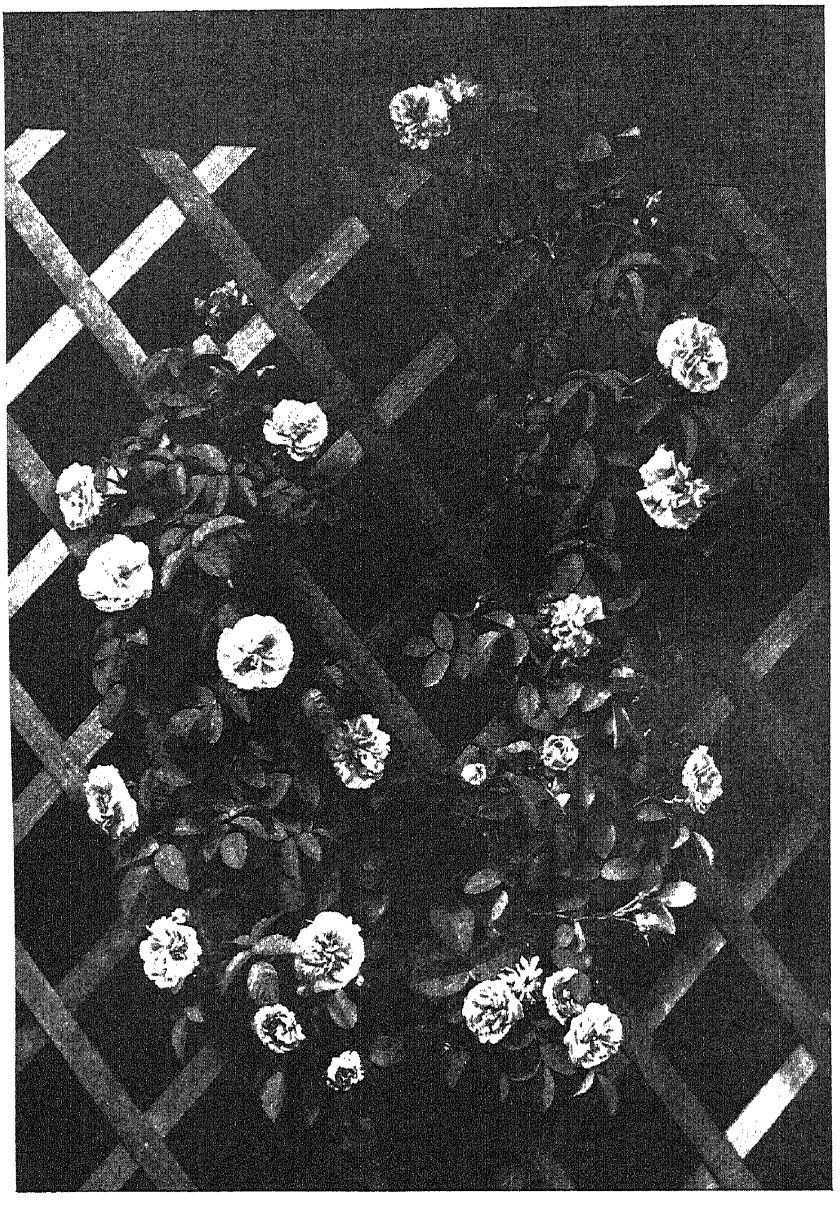


FIG. 114.—ROSE 'PETITE DE HOLLANDE.'

[*To face p.* 421.

No Rose is better able to look after itself than the Sweet Brier, and pruning should be limited to an occasional branch-thinning to get fresh growth from below and thus prevent the leggy appearance often seen in unpruned plants.

SEMI-DOUBLES.

Of the semi-double forms of the species, some of them favourites in old gardens, one of the best known is the double rose-pink form of the Cinnamon Rose (*R. cinnamomea*) a native of Northern Europe and Asia. This was known to GERARD in 1597. Most of the herbalists of the sixteenth century include it as *Rosa majalis*—the 'Rose of May.' The flowers are 2 inches across, with about thirty-five to forty-five small petals, curved and twisted.

The bush grows about 5 feet in height. It can be distinguished at once from others by its thorns, which are in opposite pairs at the base of each leaf and no more.

The next, which is sometimes confused with it, is the double form of the Virginian Rose (*R. virginiana*, formerly *R. lucida*) and known as 'St. Mark's Rose' and 'Rose d'Amour.' It is only semi-double and the shining leaves serve to distinguish it at once from the Cinnamon Rose.

Very pretty is the double form of the Alpine Rose (*R. rubrifolia*), a cupped flower like a small China Rose and of a purplish-pink. This can be distinguished from those named above by the claret-coloured leaves.

* * * * *

This paper is necessarily limited to the outstanding varieties, and there are many more in my collection which require time for comparison and study until I can recommend them as desirable and distinct. Many come to me with old names and often turn out to be modern varieties. A little patience is required before we can sort out all these interesting visitors from other gardens, but all are welcome who like to present themselves for examination.

In conclusion I must thank many donors in all parts of the country for their help in recovering many lost varieties. The splendid freemasonry of gardening has made them anxious that others should share their treasures and to them my thanks are due. I have also to thank the proprietors of Country Life for permission to reproduce the figure of Rose 'Village Maid.'

JOHN RENTON AND OTHER HOXTON NURSERYMEN.

By W. ROBERTS, F.R.H.S.

CATALOGUES of books on gardening have been so frequently printed from the time of R. WESTON in 1769 to the Hon. Mrs. EVELYN CECIL'S History of Gardening, 1910, supplemented by those of such special collections as the Lindley Library, the Arnold Arboretum, the Massachusetts Horticultural Society, and others, that a new name is not easily come by. And even when one is thought to be found there is a natural hesitancy to bring it forward for fear that it may be revealed lurking in some unexplored corner. If it should be shown that the name of JOHN RENTON, of the Hoxton Field Nursery, *circa* the 1780's, is not new at all, I can only plead that an exhaustive research in many books and in many libraries in London and elsewhere has entirely failed to find even his name mentioned.

It is not claimed that JOHN RENTON was an outstanding genius in gardening annals, but he published, or rather compiled, a comprehensive Treatise on Gardening, extending to over 90,000 words, which appeared as an integral part of one of the many rival Cyclopædias which were published in the second half of the eighteenth century. The bookseller from whom I obtained the Treatise as an excerpt, states that it came from EPHRAIM CHAMBERS'S Cyclopædia. This publication, which was the first systematic English Encyclopædia as we now understand the term, was first issued in parts in 1728, and new editions—the later ones were edited by ABRAHAM REES after CHAMBERS'S death in 1740—continued to appear for a century. In format and typographically the Treatise very closely resembles the later editions of REES'S Cyclopædia, but I have not found it in this publication, in which the general article on gardening usually extends to only a column or so. I think the Treatise must have appeared in one of the several rivals to REES'S, but I have so far failed to track it down. Its thirty-six double-column folio pages are unnumbered, which leads me to think that for the long articles on such special subjects as the Treatise there may have been a considerable demand from readers who would not subscribe to the publication as a whole. The Treatise formed Nos. 78 to 81 of Vol. 2 of the work in which it appeared, and the signatures run from Xxx to 4 F, each signature consisting of two leaves (4 pages).

It may be urged that this Treatise on Gardening, not being a substantive publication, does not fall within the limitations of a Bibliography of Gardening, but I think that its length and its scope justify its being regarded as a distinct item; and for that as well as for other reasons, it calls for special notice. It has a horticultural

interest much beyond the writer, and involves others of far greater consequence.

JOHN RENTON was probably born in Hoxton or Hackney, and seems to have lived in the district all his life. I am much indebted to Dr. CONRAD LODDIGES—the great-great-grandson of the original founder of the famous firm at Hackney—for some particulars of JOHN RENTON: he was born about 1747 and died on July 18, 1810, his widow surviving until March 1825, when she died at the age of 75. Both JOHN RENTON and his wife, with two infant grandchildren, are buried in Hackney Churchyard. They had two children, JOHN, who became an artist and will be dealt with presently, and a daughter who married JAMES, the youngest child of the Rev. JAMES CREIGHTON, B.A., of Hoxton, a priest of the Established Church of Ireland, who joined JOHN WESLEY the evangelist. WILLIAM and GEORGE LODDIGES, sons of CONRAD, married ALICE and JANE, two of CREIGHTON'S daughters.

There is a tradition in the LODDIGES family that JOHN RENTON was the head gardener at the LODDIGES nurseries—perhaps the term foreman would be more correct—towards the end of the eighteenth century. Probably he served his apprenticeship there, remaining with the firm until he set up for himself in the adjacent Hoxton. At the end of his Treatise he gives his address as Hoxton Field Nursery, and announces: "Those Noblemen and Gentlemen who wish to be furnished with any of the Articles requisite for putting into execution the different practices here recommended, may be supplied from my Nursery; where all orders will be duly attended to." It is reasonably certain that he was established here for some years before this Treatise was printed, and this may be tentatively placed in the 1780's. Of the few books to which he definitely refers, the latest would seem to be SPEECHLEY'S monograph on the Pine Apple, which first appeared in 1779 (2nd ed. 1796). It may be assumed that the business in Hoxton did not have a long life; and Mr. THOMAS GREEN, Borough Librarian of Shoreditch, has very kindly gone through the local collection, and has consulted books which might be expected to yield some information about JOHN RENTON the nurseryman, and has found no reference to his name at all. Mr. ERNEST J. BARTLETT, who has made a special study and topographical collection of the district, very kindly tells me that the Hoxton Fields occupied by the horticulturists such as FAIRCHILD and others (including presumably JOHN RENTON) were between Hoxton Street and the present St. John's Road, in the vicinity of Ivy Street and Ivy Lane, which are on the right-hand side of St. John's Road beyond the parish church.

Hoxton, formerly part of Hackney, is now included in the Borough of Shoreditch. Its connexion with horticulture dates back for over three centuries. It has long ceased to suggest flowery meads and purling streams. When, as the compilers of Old and New London tell us, the citizens of London wanted to take lodgings for the summer at Islington, for the pure and healthy air, the district all round must

have consisted of open fields, and nothing met the eye between Hoxton and Stoke Newington. It inspired THOMAS JORDAN to write a comedy, "The Walks of Islington and Hogston," * 1657, which "was publikely acted 19 days together with extraordinary applause." Many years before this—in 1598—BEN JONSON, the dramatist, in a duel killed a fellow actor, GABRIEL SPENCER, in one of the fields here. In 1757 JOHN MOBBS, a Northamptonshire coalman married the daughter of his old master, a rich London distiller, and became the owner of a large agricultural estate in Hoxton and Islington: he mortgaged part to Mr. C. H. STURT, of Crichel, Dorset, ancestor of Lord ALINGTON. When the sale of this estate was contemplated in 1917, it consisted of some 130 acres comprising 13 miles of streets with a rent roll of £50,000 per annum. The estate constituted "Mobbs' Millions," which was for half a century the object of many successive—and unsuccessful—claimants as "rightful heirs." It is reasonably certain that JOHN RENTON'S "Hoxton Field Nursery" was comprised within this estate, one of the many nurseries and market gardens which for so long flourished here up to a century ago. The story of the transformation of Hoxton from a rural and agricultural district, with a few fine houses and estates scattered here and there, to a crowded area of mean streets, is the same as that of other London suburbs; the transition stage was always one of nursery and market gardens. We get a glimpse of Hoxton in its halcyon days from the engraved views of Balmes or Baums House, built in the seventeenth century "on a scale of great magnificence" by Sir GEORGE WHITMORE, Lord Mayor of London (he died in 1654). A view of it in 1750 appears in Old and New London (Vol. V, p. 528); another and later one is from the European Magazine in 1810 (fig. 115)—it has a melancholy literary interest, for it became an asylum, of which CHARLES LAMB was once, and MARY LAMB more than once, an inmate.

In The Times of May 27, 1938, the Vicar of St. John's, Hoxton, (the Rev. P. H. HARLEY), in appealing for funds for the maintenance of the church and various schools in his densely populated parish, states that there are upwards of eighteen thousand souls living there in only seventy-three acres—with no open space save the churchyard.

The earliest reference to gardeners in Hoxton that I have found is the record that in the year 1633 "JOHN NOBLE, Gardiner of this Parish [St. Leonard's, Shoreditch] and another Person unknown, left certain Monies for 2 Sermons yearly for ever, to be Preach'd by the Vicar, for the time being, one on November the 5th, the other on St. John's Day, at Christmas-Tide, against *Excessive Gaming*, for which he is to have £1. 10/- issuing out of the Parish-rents, & £1 yearly to the Poor of this Parish for ever" (New Remarks of London, 1732, pp. 227–8). The most famous of all the nursery gardeners at Hoxton was THOMAS FAIRCHILD (1667–1729), a correspondent of

* This old and unlovely name gradually softened into its more familiar designation in the eighteenth century.

LINNAEUS, whose portrait is in the Ashmolean Museum, Oxford; he is frequently mentioned in RICHARD BRADLEY'S New Improvements of Planting and Gardening, and left a bequest of £2 yearly for the preaching of a sermon at St. Leonard's, Shoreditch, on every Whit Tuesday, and that has been continued down to the present time.* FAIRCHILD was followed by his nephew, as appears from an advertisement in a London newspaper November 15, 1729: "STEPHEN BACON, Nephew to Mr. FAIRCHILD, the late famous Gardener at Hoxton, who hath managed his Uncle's Business with Success for these several Years past, succeeds his said Uncle in the Gardens, and is possess'd of the whole Stock of exotick Plants, Fruit Trees, &c. and supplies Gentlemen with the utmost Care and Fidelity, as before." But STEPHEN BACON seems to have left no "footprints in the sands of time." The Daily Journal of August 26 and 30, 1729, contained an account of the flowering of a Cereus at Hoxton—possibly in FAIRCHILD'S nursery.

Earlier than FAIRCHILD, GEORGE RICKETS (or RICKETTS) was a famous Hoxton nurseryman and florist in the seventh decade of the seventeenth century. REA in his Flora describes him as "the best and most faithful florist now about London," and WORLIDGE refers to him in enthusiastic terms as "the master-florist of England." But a certain J. GIBSON, who wrote "A Short Account of London Gardens" (reprinted in W. C. HAZLITT'S Gleanings in old Garden Literature) in December, 1691, is not so enthusiastic. RICKETS then had "a large ground, and abundantly stocked with all manner of flowers, fruit trees and other garden plants," but "he sells his things with the dearest, and, not taking due care to have his plants prove well, he is supposed to have lost most of his custom."

There is a definite proof of GEORGE RICKETS being in business at Hoxton in 1678. In her most interesting book, Life in a Noble Household, 1641–1700, based entirely on the archives at Woburn Abbey and published last year, Miss GLADYS SCOTT THOMSON, M.A., F.S.A., deals on pp. 239–261 with the gardens there and at the Duke of BEDFORD'S London house, and with the various tradesmen who supplied plants and shrubs. She mentions that in 1692 JAMES RICKETS supplied the Duke with Peach trees and the Lily of Constantinople. At my desire Miss SCOTT THOMSON very kindly made a further search in the Woburn archives, and tells me that in 1678 JAMES RICKETS receipted a bill "for my father GEORGE RICKETS." Later bills, in the 1680's and 1690's, are signed and endorsed "JAMES RICKETS." If, with the Duke of BEDFORD'S consent, Miss SCOTT THOMSON could be induced to publish a full synopsis of the gardening documents at Woburn Abbey, it would almost certainly prove to be a

* Some, at least of the earlier ones, were printed. I have that of the first, May 19, 1730, and those of May 15, 1733, and June 4, 1745, all preached by the Rev. JOHN DENNE (1693–1767), Archdeacon of Rochester and Vicar of St. Leonard's, Shoreditch. In committing his sermons to the public the worthy Archdeacon supplied them with elaborate notes and other extraneous matter that make them far from easy reading.

contribution of the highest value to the history of horticulture in this country.

Apparently FAIRCHILD'S nephew was followed by one JOHN SIMPSON, for in a London newspaper dated July 12, 1740, there was an advertisement of the sale "in the whole or in parcels," of the stock of curious flowers and plants "of Mr. JOHN SIMPSON, deceased, at the Garden of the late Mr. FAIRCHILD of Hoxton."

Another Hoxton nurseryman of note was JOHN COWELL (who died about 1730) frequently mentioned by BRADLEY, SWITZER and other horticultural writers of the period; he wrote An Account of the Aloe, 1729—one flowered in his garden in this year and of it an engraving was published at the time—and The Curious and Profitable Gardener, 1730. Of other Hoxton gardeners, it is only necessary to mention BENJAMIN WHITMILL * and his son, whose Kalendarium Universale; or the Gardeners Universal Calendar, first appeared in 1726 and had reached its seventh edition in 1765.

It will be noticed that the Hoxton nurserymen, or gardeners as they were generally called, realized the great value of publicity. They nearly all wrote papers or published books on phases of their business. It was the only means of becoming known to likely customers in other parts of the country. There were no great central exhibitions at which they could stage the products of their gardens and greenhouses, and the "Florists' Feasts" which became so popular as the eighteenth century advanced were almost exclusively the "preserves" of the small amateur and cottage gardener.

JOHN RENTON, therefore, in his Treatise on Gardening, was only following a precedent set by other Hoxton nurserymen. As to the Treatise itself, it is obviously a compilation, for JOHN RENTON could not possibly have written so fully on both the principles of landscape gardening and on the practical side of the subject. In a notice at the end of the Treatise, and in what would have been the Preface if the essay had been published as a substantive book, it is stated: "The first article in this Treatise which describes the constituent parts of the scenes of nature; and the second which illustrates those properties in the objects of nature that should determine the choice and management of them in Gardening; are extracted from a very valuable Work, and abridged to a fourth of its original compass, by selecting the most beautiful and essential passages." Thus JOHN RENTON voluntarily deprives himself of patches of his fine feathers, leaving some industrious investigator of the future to trace the "very valuable Work" to which he so generously helped himself. Even in the practical part of the Treatise the author holds himself indebted to other works, but has "pruned them of their excrescencies and lopped off their superfluities." But no extraneous help is acknowledged in the directions for the management of the Kitchen Garden, and we may take it for granted that this section was his own.

* JOHNSON, History of English Gardening, 1829, p. 196, in error calls him BENEDICT WHITMILL; possibly that was the Christian name of the son.

Whilst JOHN RENTON must be regarded as one of the *scriptores minores* of gardening literature, he has a further, if adventitious, claim to notice. It has already been mentioned that his son and namesake became an artist. The younger RENTON was a fairly regular exhibitor at the Royal Academy from 1799 to 1839, of portraits chiefly, but also landscapes* and fancy subjects; and at the British Institution from 1806 to 1832, chiefly landscapes and subject pictures. His name does not appear in the lists of Royal Academy students, so he must have been trained at one of the several privately-owned art schools. In 1799 his address in the Catalogue is given as Hoxton, in 1801 J. RENTON, Jr., Hoxton Fields, and thenceforth with few exceptions his usual address is either 19 The Pavement, Moorfields, or West Street, Finsbury Place. There can be no doubt about his identity. In the Print Room of the British Museum there are thirty engravings after portraits painted by him—an extraordinary number under the circumstances. They are nearly all of dissenting divines, and most of the engravings were done for the Methodist Magazine, and other periodicals of the various denominations, from 1818 to 1829. Of these thirty portraits the originals of only three had the distinction of being hung in the Royal Academy.

It must be remembered that from the latter part of the eighteenth until well into the nineteenth century Hackney, and the surrounding district, was dominated by Nonconformity of various types—their schools, colleges and institutions of various kinds, as well as with many private residences of dissenters—it was the Mecca of Nonconformity. JOHN RENTON, Jr., probably belonged to one of the sects; and it is quite certain that here he found a fairly rich quarry for the exercise of his talents. But if he painted only the portraits of these long since forgotten worthies he would have very little claim to be mentioned here.

He has, in fact, a very strong claim to be noticed, for he painted the portraits of two men who rank very high in the history of horticulture and botany in this country. Both these portraits have remained in the same family, unengraved and practically unknown outside the family until the present time. Among the younger JOHN RENTON'S three exhibits at the Royal Academy of 1818, No. 554 was "C. LODDIGES, Esqr." (1738–1826), and this portrait, signed but not dated, is now the property of the sitter's great-great-grandson, Dr. CONRAD LODDIGES, formerly of Birmingham; unfortunately the portrait is warehoused and it is impossible to reproduce it here. At about the same time JOHN RENTON painted the portraits of CONRAD'S son, GEORGE, and the latter's wife (*née* CREIGHTON), and these are now in the possession of Mrs. G. B. LODDIGES, widow of another great-great-grandson of the founder of the famous Hackney firm. Both are what is known as "kit-cat" size, *i.e.* 35 × 27½ ins. The portrait of Mrs.

* There is a reproduction in colours of one of his landscapes, Garvald Tower, Haddingtonshire (exhibited at the Royal Academy in 1812), in Colonel GRANT'S monumental English Landscape Art.

G. LODDIGES was No. 390 in the Royal Academy of 1821; that of her husband was not exhibited. By the courtesy of the present owner the portrait of GEORGE LODDIGES (1784–1846) is reproduced here (fig. 116). It will thus be seen that, for the third time and in totally different ways, the families of RENTON and LODDIGES were linked together. Between JOHN RENTON, Jr., and GEORGE LODDIGES there was the additional bond of art, for the latter was himself an accomplished artist, and drew most of the plates in the Botanical Cabinet (1818–34), which were engraved by GEORGE COOKE, whose brother, E. W. COOKE, R.A. (1811–1880), married JANE LODDIGES, grand-daughter of the first CONRAD. It is interesting to point out that G. LODDIGES, who was a Fellow of the Linnean Society, contributed a paper on A method of conveying Water to Plants in Houses to volume III of the Transactions of the Society, 1820, and in volume IV, p. 56, there is a "Description," accompanied by plans, of the steaming apparatus erected by Messrs. LODDIGES AND SONS at Hackney, and the Society records its appreciation of "the laudable spirit with which a work of such magnitude has been undertaken and so perfectly executed." An obituary notice of him appeared in the JOURNAL, **1**, p. 224. The only other exhibit of JOHN RENTON, Jr., at the Royal Academy which suggests horticultural interest is that of a portrait of J. PAXTON in 1802, No. 829. One wonders if this J. PAXTON was any connexion of the family of the future Sir JOSEPH PAXTON, who was an infant of twelve months at this time.

Whilst circumstances seem to have largely confined the younger RENTON to painting portraits of an unattractive type, his portrait of GEORGE LODDIGES proves him to have been an excellent and accomplished craftsman. It gives one the impression that it is true to life, and that it represents a refined and intellectual man. Most portrait painters of the period came under the influence of Sir THOMAS LAWRENCE, and the younger RENTON was no exception; this portrait is worthy to rank with those of LAWRENCE.

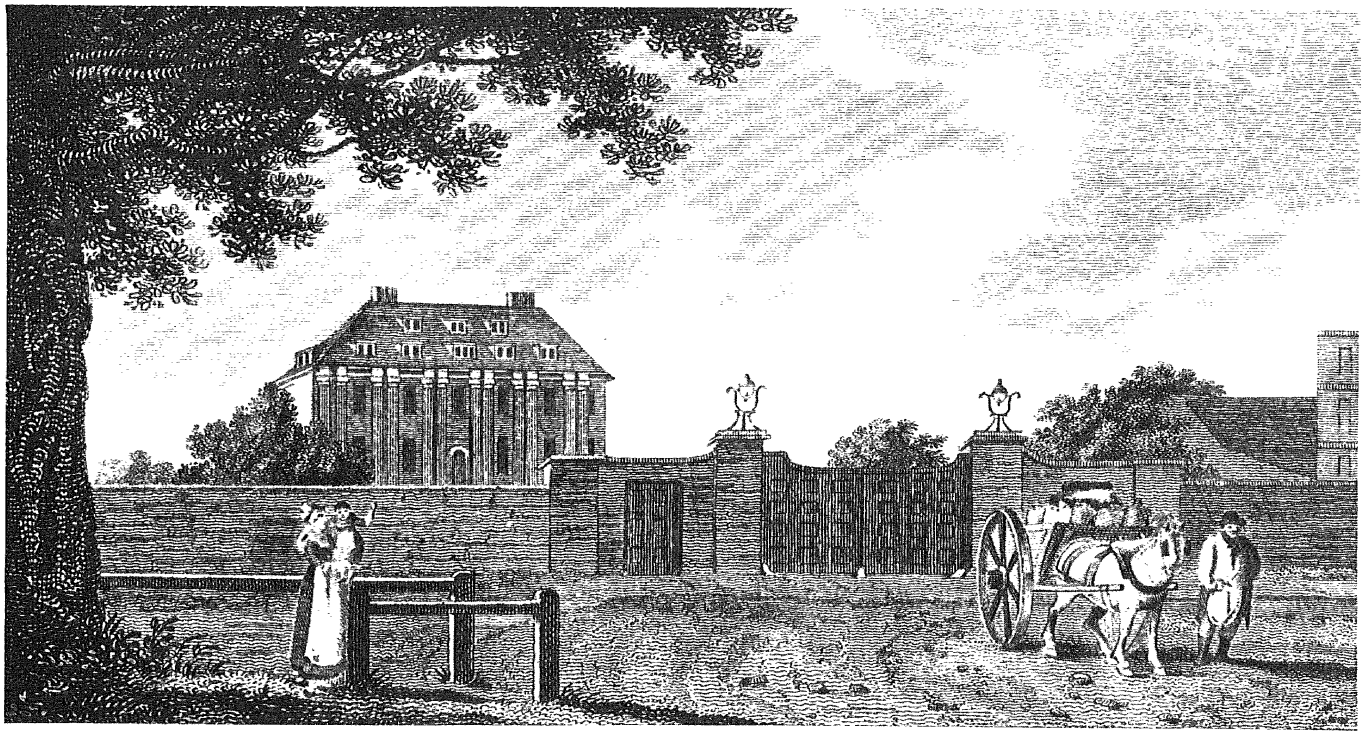


Fig. 115.—Balmes or Baums House, Hoxton (c. 1810).

To face p. 428.

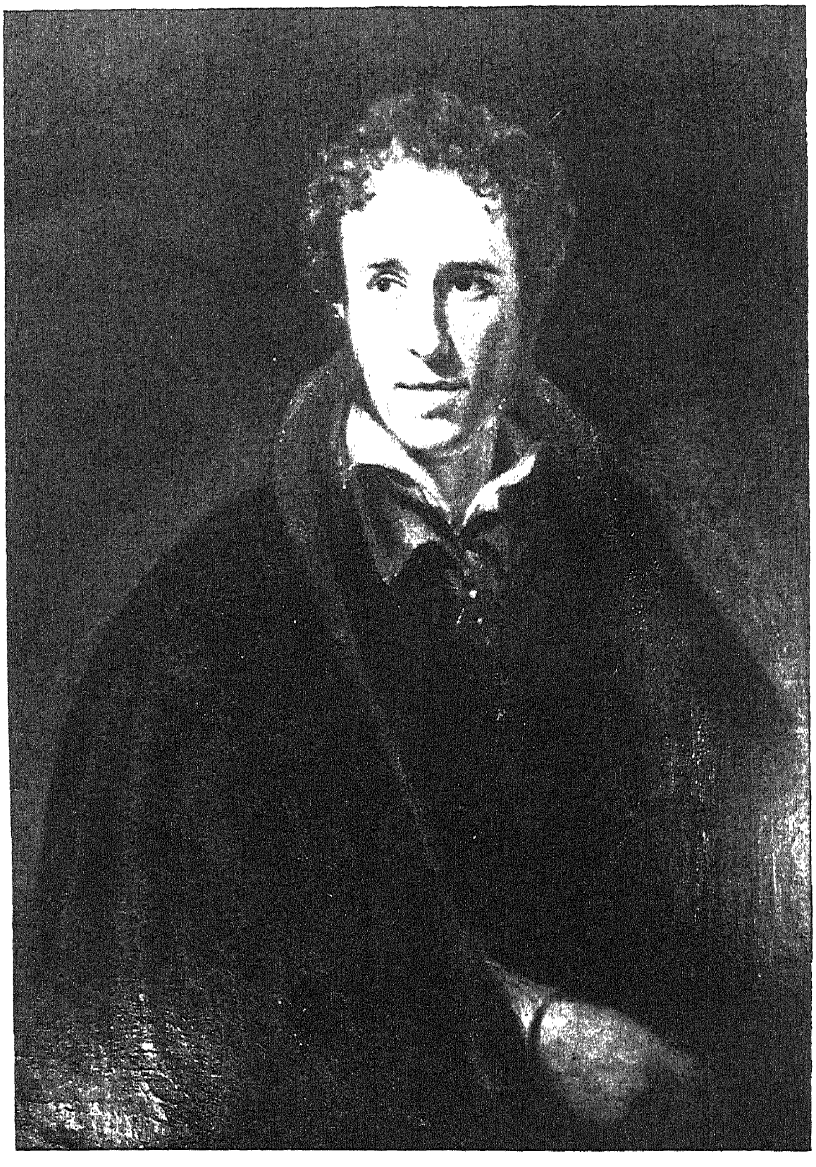


FIG. 116.—GEORGE LODDIGES. BY JOHN RENTON.
(By the courtesy of Mrs. G. B. Loddiges.)



FIG. 117.—APPLE TREE IMMEDIATELY AFTER FRAME-WORKING.



FIG. 118.—APPLE TREE FOUR MONTHS AFTER FRAME-WORKING.
(cf. fig. 117).

[*To face p.* 429.

FRAME-WORK GRAFTING OF FRUIT-TREES.

By W. FRANK WALKER, Tasmania.

FRAME-WORK grafting has developed a great deal in Tasmania during the last ten years; and it has also been practised in other fruit-growing states of the Commonwealth of Australia. The frame-working of apple trees in Tasmania was begun after the Great War. The method passed through experimental stages and by the end of 1930 had developed sufficiently to be used economically by commercial growers.

Many of the early-established apple orchards were comprised of some varieties which were quite inferior in quality and unsuitable for the market, and such were invariably handled at a loss. Other varieties, though possessing good shipping qualities, were rapidly falling into disfavour, owing to the introduction and development of more generally popular varieties. Increased production had given consumers a wider selection of high-quality fruit. Thus it became apparent that many varieties which were of little or no commercial value, were not worthy of retention. Such orchards were either grubbed and replanted, or top-grafted with more profitable varieties. Replanted orchards rarely made satisfactory growth on old apple land, consequently other kinds of fruit were planted on these sites. In some districts it was quite a common practice to follow apples with pears because of the failure with apples, in spite of the tradition of following " pip with stone." In the latter case the market prospects of plum production were very limited.

Top-grafted trees proved very susceptible to a form of " die-back " reported to be caused by the fungus *Polystictus versicolor*. Moreover, the disease appeared to become more common with the passing years. Similar trouble has occurred in England, but here it is attributed to the Silver-leaf fungus (*Stereum purpureum*) and is commonly known as " papery bark canker."

As early as 1920 in some districts top-grafting was always followed by " die-back," and many growers would not attempt grafting owing to the grave risks of losing their trees. In spite of considerable care in covering all wounds and the use of treatments designed to encourage rapid callusing, the disease far too often entered the tree. In some cases " die-back " would appear on trees bearing five- to six-year-old grafts, where large wounds caused by the removal of branches at grafting-time were almost completely covered with callus growth. Many ingenious preparations were used for painting the wounds to prevent the entry of the fungus, but this application entailed considerable time and expense, and proved impracticable in large orchards. It was observed that smaller limbs, of 1 to 1½ inch in diameter, usually

callused in one season and the disease was less prevalent. Because of this it soon became customary to practice less severe heading back, and by top-grafting higher up the limb smaller wounds were made. In some cases less than half the length of limb was removed. Some of the small secondary limbs and lateral spurs were cut back and rind grafted in order to cover up the bareness of the lower limbs, prevent sun-scald and utilize this fruit-bearing area. Naturally, many shoots and " suckers " arose from the limbs and these were either removed altogether or reworked by either budding or whip-and-tongue grafting.

The abundance of these sucker shoots led to the development of a method often referred to as the " multiple bud " system of reworking fruit-trees. Here the limbs were only lightly headed back, but were completely denuded of spurs, lateral twigs and small secondary limbs, all of which were cut back close to the main frame-work. This was carried out in the winter or early spring. Of the shoots which arose from the limbs, the best and most suitably placed were retained and budded in the summer as close as possible to the limbs.

This method was successful in checking severe " die-back " attacks, but it had the following disadvantages : (i) Often shoots from the limbs did not arise where they were desired and bare spaces resulted. This prevented an even distribution of scion-growth and the tree at times developed an unbalanced appearance. (ii) The budding of such shoots was slower than budding rootstocks in the nursery row, and coming during the growers' busy season competed with other orchard operations. (iii) Unlike the growth arising from the scions having numerous buds, the growth from the buds inserted singly was so vigorous that the return of the tree to profitable cropping was much delayed.

By 1930 it became obvious that by methods of frame-work grafting or budding losses from " die-back " could be minimized and the trees returned to normal bearing more quickly than by top-grafting. In that year with Messrs. FRANK WALKER & SONS of Lalla, Tasmania, the writer interested himself in experiments in frame-work grafting. It was decided to see whether frame-working could be carried out economically on a commercial scale. Over fifty large apple trees consisting chiefly of ' Pomme de Neige ' (' Fameuse '), ' Emperor Alexander,' ' Late Aromatic,' ' Crow's Egg ' and ' Blue Pearmain ' were reworked with scions of ' Tasma Pride,' ' Democrat,' ' Crofton ' and ' Worcester Pearmain.' The limbs were only lightly dehorned, being cut back about three feet, and thus practically the whole of the tree frame-work was retained. All spur growths, laterals and small secondary branches suitable for grafting were either whip-and-tongue grafted or rind grafted. In places where the spurs were too small and weak to graft they were completely removed and inverted-L bark grafts (see below) were inserted in the limb itself. Instead of the grafts being tied and waxed, which meant two operations, they were bound up with home-prepared waxed cloth. This waxed cloth was prepared by dipping a very cheap form of printer's cloth into a hot and liquid mixture of soft grafting wax. Suitable strips of this cloth were torn as required.

From these early experiments it was shown that frame-work grafting was practicable upon a commercial scale in Tasmania. Most of the trees yielded very satisfactory crops the second summer after grafting, a few of the larger trees bearing as many as ten bushels of fruit. It was noticed that some varieties cropped much earlier than others. From 1931 onwards almost all frame-work grafting at the Lalla orchards has been done with the inverted-L bark grafts inserted under the bark of the limbs which were completely denuded of all spurs and other growths.

The Inverted-L Bark Graft.—This method of frame-working fruit-trees has been used very extensively, especially in Tasmania where it has met with much success. It has also been practised in Australia,

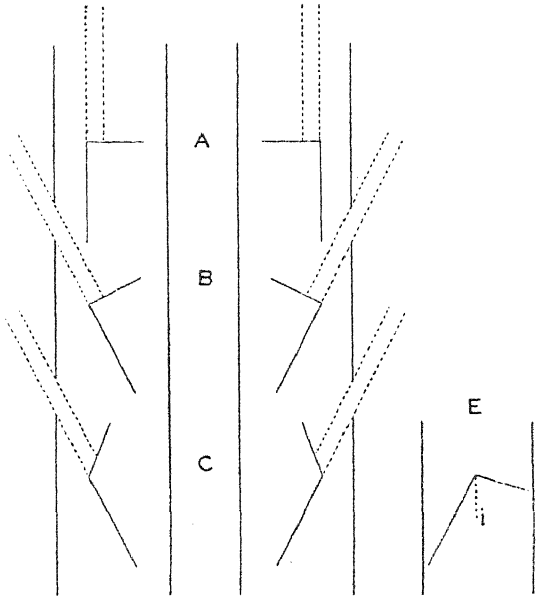


FIG. 119.—INVERTED-L BARK GRAFT.

New Zealand, South Africa and England. The term "inverted-L" merely describes the type of incision made in the bark of the limb and is illustrated diagrammatically in fig. 119. This incision has been modified somewhat to enable better fitting and placing of the scion. Fig. 119A illustrates a typical inverted-L incision, but such would allow the scion to rest alongside the limb, and because of this it has been modified as in fig. 119B. In fig. 119C there is a further modification, attained by making the top cut more than 90 degrees away from the lower and longer cut. By this means the scion is held more firmly and the entry of water behind the scion is prevented and good callusing is effected. Fig. 119E shows the wrong way of making the incision, as the bark often splits at (i) when the scion is inserted and this results in an unsightly callus.

In preparing the scion, a long sloping cut (fig. 120C) is made at the

basal end as in a whip-and-tongue graft. This cut will be referred to as the back of the scion. A thin layer of bark is then removed from the frontal base (fig. 120D) of the scion and slightly towards one side; and a very thin straight strip (i) is trimmed off at right angles as in fig. 120C and D. After preparing the scion the incision is made in the bark as in fig. 120A. The longer and lower cut is between 1 to 1½ inch in length, and made a little shorter than the length of the prepared base of the scion. The bark is cut through to the wood tissues. The top and shorter cut is made at an angle greater than 90 degrees and approaching 150 degrees to the lower incision. As can be seen in the figure this top cut is made through to the cambium tissues next the wood, but unlike the previous cut is sloped through in a bevelled fashion. This is done so that the scion rests closely on the cambium

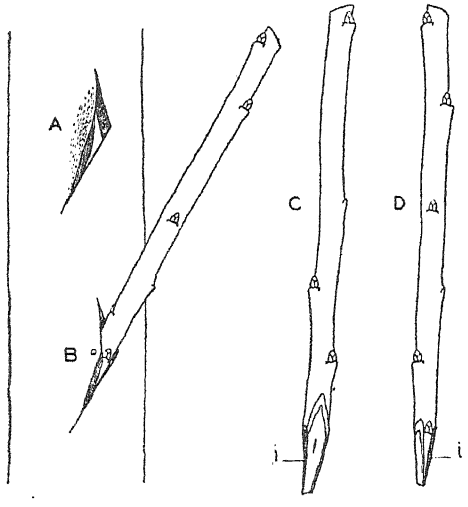


FIG. 120.—INVERTED-L BARK GRAFT.

tissue. Then by slightly raising the bark from this top cut, the scion base is inserted and pushed down under the bark as in any rind graft, so that the back basal part of the scion rests upon the wood of the limb, and the raised bark overlays the cut frontal surface of the scion. In pushing the scion down under the bark care must be taken that the trimmed side (fig. 120D (i)) rests firmly against the edge of bark made by the longer and lower cut, and that the thin tapered base of the scion is not damaged in any way. The scion is held firmly in position by driving a small flat-headed nail straight through the raised bark, the scion base and into the wood of the limb (fig. 120B). These nails are ⅝ inch in length and of 19 gauge, and cause no apparent damage to the graft. The preparation of this type of graft may seem very involved, but can be quickly performed after practice; and efficient persons can do over 100 grafts an hour. In Tasmania a very dark crude form of petroleum jelly is used to seal the wounds, because this

is cheaper than grafting-wax and also prevents Woolly Aphis (*Eriosoma lanigerum* Hausm.) from attacking the newly formed callus.

Such grafts have advantages over methods previously used in Tasmania, in that they take less time to prepare and can be evenly spaced over the whole frame-work, and in sufficient number to return the tree to a normal and early bearing condition. It was observed that where whip-and-tongue, rind and inverted-L grafts were performed on the same tree, the latter type often appeared to be checked, and this was considered to be due to the vigorous growth of the former. Fewer suckers arise from trees refurnished entirely with inverted-L bark grafts, and this is probably due to the removal of many deep-seated eyes at the base of the spurs and laterals which are cut away.

Other Methods.—Several other modifications and methods have been and still are being used to overcome the extra time of tacking and tying

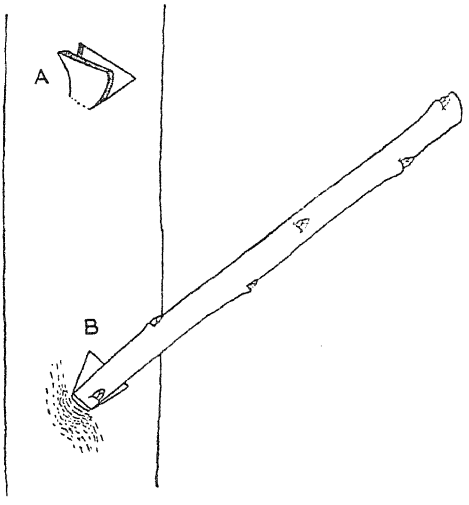


FIG. 121.—V-SHAPED BARK GRAFT.

in the grafts. Some of the improved inverted-L grafts grow away well if untied or untacked, but this is not always so.

The Chisel Graft.—This was one of the earliest methods used to overcome the tacking or tying in of grafts on frame-worked trees. It is really a form of oblique-cleft graft. As a chisel has been used to make the cleft in the limb, this method has been called the "Chisel" graft and is sometimes referred to as the "Plug," "Peg" or "Porcupine" graft. This oblique-cleft is made in the cleared tree frame-work by means of a chisel having a thin blade of $\frac{3}{8}$ inch wide. This chisel is tapped obliquely, by means of a small mallet, through the bark and a little distance into the wood. Then a wedge-shaped scion is tapped by the mallet into the cleft made by the chisel, and the wound is sealed over with a suitable preparation.

This method is successful if performed in such a way that the cleft is not made too far into the wood of the limb, and the scion fitted nicely into the opening. The writer has seen some very poor results

from this method, and at times very faulty unions are to be found. It should be realized that union between stock and scion takes place only around the cambium tissues, and scions driven into cleft wood tissues never unite there. If the scion does not fit the cleft exactly a decayed area will result. Long scions containing many buds cannot be used because they bend when tapped with a mallet. This type of graft was used in Tasmania and is still used extensively in Victoria.

The V-shaped Bark Graft.—This method is so called because of the V-shaped incision made in the bark. It is a bark or rind graft which allows the prepared end of the scion to rest between the bark and cambium tissues of the limb. As in fig. 121A a small V-shaped incision is made in the bark, and the base is not cut until the scion is inserted. The scion is prepared in the form of a flattened wedge,

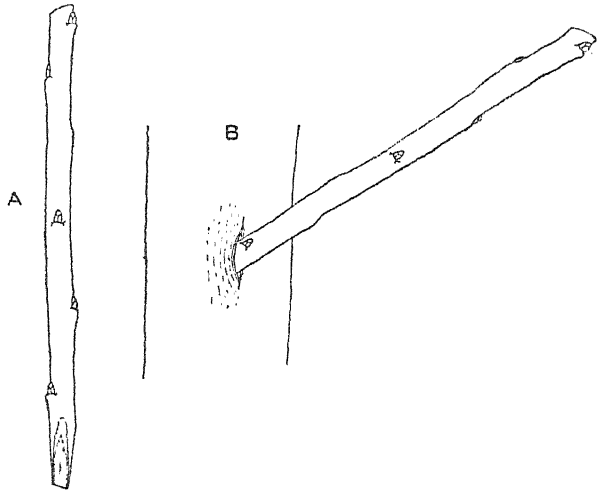


FIG. 122.—THE AWL GRAFT.

similar to fig. 122A, and is inserted and pushed down behind the raised V-shaped lip of bark which is cut off neatly as in fig. 121B. This graft only needs waxing and the bark holds the scion firmly without any tacking. The method has been quite successful, and from its principle the " Awl " graft has been developed.

The Awl Graft.—The Awl graft has sometimes been referred to as the " Needle " graft merely because a sacking needle may be used for making the bark incision. It is a bark or rind graft and does not require any tacking or tying. The scion is prepared in a flattened wedge form made by two sloping cuts about one inch in length on opposite sides of the base (fig. 122A). A small screwdriver with a bent point or sacking needle is used to make an incision through the bark. The point of this tool is pushed about ¼ inch under the bark around the limb, just sufficient to raise the bark from the limb. The base of the scion (fig. 122A) is then inserted in the small cavity behind the screwdriver or needle which is then removed, and the scion pushed

firmly along underneath the bark until the whole cut surface is out of sight. Fig. 122B depicts the graft completed and ready for waxing.

Although this method is still in its experimental stage, grafts which have been done for over four years are growing very well. It is worthy of note because of the ease and simplicity of the method.

An English Method.—Although this article describes methods and experiences found in Tasmania, another very successful method of frame-working developed in England is worthy of attention. This method is known as " Stub-Grafting " and was first used in frame-working experiments at East Malling Research Station in 1932. A full report of this method together with other methods now used in England has just been published by the Imperial Bureau of Horticulture and Plantation Crops, East Malling, Kent.

The stub-graft is really another form of oblique-cleft graft and is performed on spurs, laterals and small secondary branches. The best-placed spurs and laterals of a diameter between ¼ to 1 inch are retained for grafting and the remainder are cut away from the tree frame-work. A side-cleft is made at the base of these suitable spurs and a wedge-shaped scion is inserted in the cleft, after which the top of the spur is shortened back to the base of the scion. This cleft holds the scion quite firmly and no tying is required. The chief advantage of the stub-graft is that being a cleft graft, it can be carried out much earlier in the season, whereas rind grafts cannot be used until the bark lifts freely from the wood and this is usually approaching a busy time in the orchard.

Storage of Scion Wood.—The selection and storage of scion wood for grafting is a very important matter and as frame-work grafting entails a considerable expense it is necessary to select a sufficiency of healthy wood and store it in a fresh condition until the time of grafting. Well-matured wood of the current season's growth, free from disease and having well-developed buds, is the best type of scion wood. Water-shoots are undesirable and have very weak buds.

These prunings are best tied up in bundles of one hundred while still in dormant condition, and heeled in half their length in light soil, which is not too moist, in a cool position. An ideal medium is sand. Some growers have cold-stored their scion wood, but great care should be exercised as there is a danger of killing the buds if the temperature falls too low.

Length of Scion.—From earlier experiments it was observed that the use of longer scions, possessing more than four buds, gave better results than short scions having fewer buds. When short scions, with three or four buds, are used, all the buds usually grow into vigorous shoots which take some years to form fruiting wood. By the use of longer scions with seven or eight buds, the terminal two or three buds usually produce shoots while the remainder give rise either to " dards " or fruit buds for the next season. In this way pruning for fruit is simplified and earlier cropping results.

Number of Scions to a Tree.—The number of scions used to frame-

work a tree depends upon the size and kind of tree and the method of pruning adopted by the grower. In Tasmania where a long spur and lateral system is largely practised with some varieties, the scions are spaced between eight and ten inches apart around the limb. If the future crops are desired entirely from lateral growth and small secondary branches, then the scions may be spaced twelve or more inches apart. The latter method is not practised in Tasmania. It must be mentioned that when fewer scions are used, more vigorous growth is obtained which in the future will require more skilful pruning and the tree will return to normal bearing more slowly. Far too often growers intending to reduce frame-working costs have restricted the number of scions on a tree, with the result that they obtain strong and vigorous growths which take longer to return to normal cropping.

Over ten years' experience in Tasmania has proved that the wide spacing of scions at twelve and more inches apart on the frame-work has yielded less fruit which has cost relatively more to produce. When scions are so placed, the whole tree frame-work is not fully utilized ; and the vigorous scion growth obtained, besides making pruning more difficult, impedes effective routine spraying. The lower portions of the tree are very much shaded by the unnatural growth ; and this appears unfavourable to fruit-bud formation. Scions placed closer together make perfectly healthy growth, but of less vigour, which is more easily sprayed and pruned. Heavier crops are obtained and the individual fruits are of even size and good quality. These advantages more than pay for the extra time spent in frame-working with scions closer together than with wide spacing. It is most interesting to find that these same advantages, already demonstrated under Australian conditions, are being realized in England.

After-care of Frame-worked Trees.—After the first season little especial care is required outside the usual cultural operations applied to normal bearing trees. As soon as possible after grafting the soil around the trees should be cultivated, as it is usually well trodden down during grafting. About two months after grafting, or when the shoots arising from the limbs are from three to six inches in length, they should be rubbed out. It is better to rub them out, otherwise, if cut out, deep seated eyes will remain at the base of such suckers and these will grow out later. After the first year and where sufficient scions have been placed on the tree, such shoots do not arise.

Some growers have summer-pruned the scion growth the first year, by cutting the shoots about half their length. Little appeared to be gained by this and the resulting growths made winter pruning more difficult. In positions exposed to strong summer winds, the shortening of scion growths has, however, prevented the unions from being damaged in the first year before they have had time to strengthen.

The unions are quite strong by the second summer, and where breakages have occurred due to heavy crops of fruit, they have usually been on weak scions and above the union. The writer can recall a



FIG. 123.—APPLE TREE TWELVE MONTHS AFTER FRAME-WORKING.

[*To face p.* 436.



FIG. 124.—APPLE TREE SIXTEEN MONTHS AFTER GRAFTING.

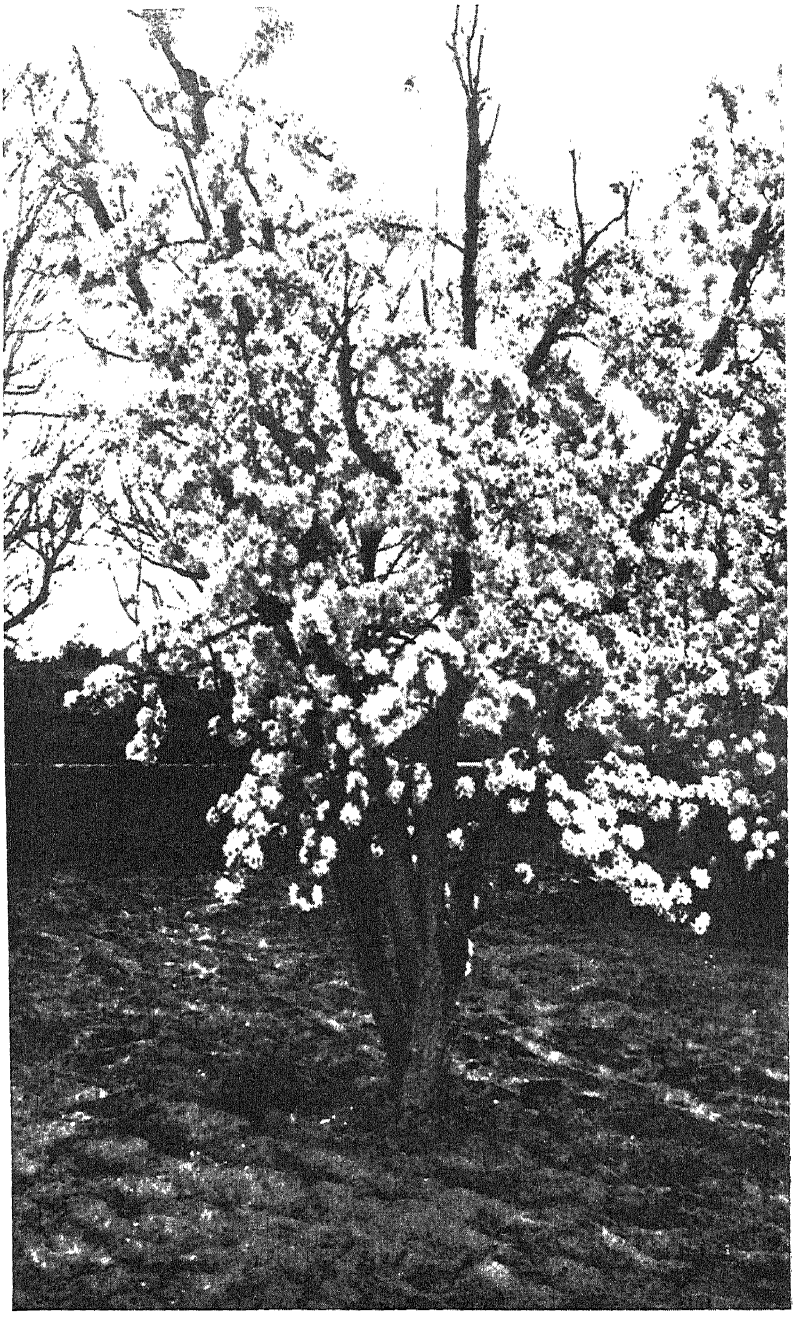


FIG. 125.—FRAME-WORKED PEAR TREE TWO YEARS AFTER GRAFTING.

[*To face p.* 437.

case where a long untipped ' Crofton ' scion of current season's growth, having more than twelve buds, was grafted on a frame-worked tree. This scion bore thirty-two apples of $2\frac{1}{4}$ to $2\frac{1}{2}$ inches in diameter the following summer without any damage to the union.

Graft Sealing Preparations.—It is very important to select a good and reliable kind of grafting-wax. A recipe of good repute should be used as it is not practical to have to go over the grafts later and reseal the unions. Frame-working is an expensive item and care must be taken that the best materials are used. There are several good grafting-wax preparations ; an ideal wax is one which effectively seals the graft, does not damage the plant tissue in any way, does not set too hard and constrict growth and will withstand extreme weather conditions without cracking or melting. In Tasmania crude petroleum jelly has been used with good results. It does not appear to harm the tree in any way and callusing takes place freely. This jelly was first used because it was cheaper and also because many of the wax recipes used tended to crack and lift from the grafts in cold weather. After sealing the graft it is a good plan to wax the terminal cut on the scion, as this encourages an earlier " break " of the buds.

Pruning Suggestions.—Methods of pruning vary somewhat in different countries and appear to be governed to a large extent by the climate. The pruning method is also adopted to suit the fruiting and growth habit of the variety concerned.

In Tasmania the earlier methods of hard spurring have been somewhat modified, and fruiting on lateral shoots has been encouraged. Vigorous lateral shoots are undesirable. With some varieties it has been found that a better quality fruit is obtained from young spurs on laterals than from older spurs on the main frame-work.

It has been found that frame-worked trees with scions spaced about 8 inches apart form shoots of moderate vigour not often more than $2\frac{1}{2}$ feet in length. Shoots longer than 18 inches are shortened a half to one-third their length. The shorter ones, if healthy and of well-matured wood, can be left full length provided they do not cross or interfere with other shoots. Some growers cut a few inches off the tips of these shorter growths. Where these weaker growths cross or crowd others, they may be spurred to six or seven buds. It should be emphasized that the above treatment is successful in Tasmania, where the scion growth is of moderate vigour due to the placing of sufficient scions on the frame-work. The first season's growth does not always show the full vigour of the tree, as it appears that very often there is some form of " latent " vigour which does not become apparent until the second season. In this respect a warning should be given against hard spurring of growth which appears to be somewhat weak at the first winter pruning.

Where growers have used comparatively few scions, twelve or more inches apart, vigorous growth is obtained, and if this is shortened by a half or one-third its length, vigorous growth is still encouraged next season. This growth will continually shade the lower bearing

out designs, and we go around searching for suitable flowers or fruit for individual receptacles and positions.

I receive great inspiration from natural growth. A herbaceous border is a splendid composition, as it is a result of choosing the best in Nature and setting them together in a certain way, with possibly a natural colour foil of green grass around. The result is far more perfect than anything we can artificially achieve by arrangement in a vase, but it is definitely a composition and, therefore, one that can be studied with benefit. Indeed the great Dutch artist VAN DER MEER, a pupil of REMBRANDT, carefully chose his houses, canals or bridges in forming his composition, and VAN DEN HECKE and VAN HUYSEN actually chose their flowers. You may see some of their flower paintings in the National Gallery.

We must, therefore, I feel, visualize the finished arrangement before carefully choosing our material.

May we now depart from the basis of composition to design? Design seems to me to depend for its effect on some well-defined principles.

One is, perhaps, the linear principle: that is, the drawing from the outside to the centre, as in the branches of the tree. The greatest example of the linear principle, the importance of which I cannot exaggerate, is given to us in springtime, when every conceivable tree and shrub shows itself in its most perfect lines, furnished with either leaves or flowers.

This law seems to me an all-important one; in fact very often arrangements that would look muddled can be pulled together by an outstanding addition of Sanseviera leaf or any similar sort of growth, but this should not be necessary. I would, therefore, commend to your notice a plain vase of twigs, showing the effect of the principle.

Next we get arrangements relying for their effect on stalks and flowers. This is aptly illustrated by Apple blossom, Magnolia, Pear, Peach and Guelder Rose.

Then we go a little farther and we get the vase of flowers that has a thick centre and the linear effect at its fringe. This is, perhaps, the most satisfying and suitable arrangement for general house decoration.

I have always been very interested in the linear principle and among the interesting books which I have read are some by the Japanese school of floral art, especially SHOKWA. The material they have to use is very different from ours and is unsuited, to a great extent, for this country, but the thoroughness with which they carry out their linear arrangement is remarkable.

Now I think we should proceed to the internal arrangement or principle of distribution of flowers from the fringe to the centre of a vase.

I suggest that every vase must have a focal point, a visual centre of gravity, compared to the centre trunk of the tree. In any arrangement it is the centre of everything.

These focal flowers can be a little larger, a little more intense than any others.

Now we have so far in our design the linear basis, the focal flowers, and then we have the silhouette. This is the outline of the flowers against the background and is another very important consideration.

It must be irregular; there must be voids. Nature hates regularity, so that no arrangement can be a success aesthetically unless we have these voids at irregular intervals.

Then there is balance or symmetry of design. It is quite obvious that a vase, of itself, must be balanced. This does not mean—far from it—that there should be the same number of flowers on one side as the other or that they should be of the same length of stalk from the container or focal flowers, but it does mean, visually, that one side should balance the other.

It is very interesting indeed to experiment with different thicknesses and lengths on one side, and then on the other, of an arrangement to obtain this result. The farther a branch extends from one side of your vase so must some branch balance on the other side. If it is shorter then it must be thicker to balance the more slender and longer branch on the other side. In fact, if a vertical line is drawn down the middle of your vase whatever is put in one side must be balanced on the other. I would especially like to point out that it is in no way necessary to have the same length on either side.

Although I am no devotee of dried flowers or seed pods there may be some excuse for using these during the winter months and there is this one advantage—they can be rearranged from time to time and their very irregularity is an incentive to achieve visual balance and an irregular silhouette. Moreover, they can be used over and over again, but without design they are meaningless. I mean to say that they can be used with advantage for the purpose of practice and achievement of unusual composition which can be copied later on in real flowers.

The arrangement must, therefore, have an irregular outline and concentration in its centre, a general line suggested from its fringe to the container and, if possible, a few flowers to break the line of the vase itself. Every flower used must have freedom and air around it. Most of us have a tendency to overcrowd our arrangements; in fact the more you put in the worse the effect.

I think I might make a few remarks on colour.

In choosing the schemes the principle of composition is uppermost and two considerations present themselves: (1) influence of the surrounding background and, when this is decided upon, (2) the variations and colour note of the vase itself.

In most flowers it is easy to pick out sympathetic and complementary colours or their contrasts. I am no great enthusiast for mixing all sorts of colours together but it is extremely interesting to take Delphiniums, with their mauvy blue effects, mixing with them as a complementary colour pink Paeonies, Dorothy Perkins Roses, or

taking a salmon Gladiolus and fulfilling its orange colour to Tigrinum Lilies, or its finer sulphur colouring to Honeysuckle and Roses. Another lovely scheme can be composed with apricot Antirrhinums, Pechtold Roses, Gloria Mundi Polyantha Roses and Umbellatum Lilies, or apricot Gladioli, apricot Antirrhinums, Roses and Afterglow Tulips.

I feel that the great thing to do in forming a colour composition is to have stronger shades as your focal flowers, where possible leading away to the less intense colour effect.

In considering colours for any particular position the closer its proximity the more intense the colour effect will be. That is, in decorating a corner vase on a staircase or in a distant hall, the brightest colours will look their best.

It is a curious thing, however, that in toned colour effects, where you get quite unusual mixtures, the longer the scrutiny the more the colours seem to blend, and as long as the colour scheme is not overbalanced by too much of an intense colour, it will be very difficult to ruin the effect. If you want to have a vase of mixed colours, the brighter and more varied the colours the less chance there is of overbalancing it.

Now for a word on containers. For flower arrangement the container plays an important part. If we have become used to and fond of certain receptacles for special places then it merely becomes a question of choosing material to suit them. For instance, we may have to use china, glass or silver for our dining table, but it is preferable to subordinate the container to the material.

I prefer containers with graceful curves, as the linear sympathy is more easily obtained than in such things as square acid containers of which, quite frankly, I could never see the beauty.

I do not think one could say there is any rule as regards the height of the container but it is a help sometimes to remember that you are usually not far wrong if the container is one third the height of the arrangement.

If it were possible to obtain urns such as we see in the National Gallery, all would be easy. But quite unusual results may be obtained from spoon warmers, soup tureens, china bowls, tea urns, round cast-iron cauldrons, china jugs or jam boilers.

General considerations affect our composition. Flowers seem always to wish to fill up a void and will take all the air and space at their disposal, and this principle very much affects our arrangements.

The composition must have a frame : it may be rectangular with a horizontal or perpendicular axis, oval, round or triangular, but at least whatever the background is the flowers seem to wish to spread out and fill it up.

Therefore the alcove presents a simple problem for design and any recess can be similarly treated.

Mantelpieces seem to require a low centre bowl with two higher groups either side, or a high centre bowl and two smaller ones on either

side, or even two quite irrelevant objects, not necessarily flowers, with a bowl in the centre.

Tables, dining tables and coffee tables, seem to call for very low flower decorations—open Tulips or Roses or mixed colour schemes in little rush baskets, whereas console tables in rooms with high ceilings, against tall mirrors, require tall flowers. You would not put a copper coal bucket filled with hollyhocks in a low-ceilinged room but it would look superb against grey stone on a staircase in an old-world castle.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Begonia 'Lucy Dare.' **A.M.** July 5, 1938. From Messrs. Blackmore & Langdon, Bath. A very handsome tuberous-rooted variety with large clear rose-pink double flowers of perfect shape.

Begonia 'Stanley Halford Roberts.' **A.M.** July 5, 1938. From Messrs. Blackmore & Langdon. A tuberous-rooted variety with very large, double, glowing orange flowers.

Border Carnation 'Angela Hawtin.' **A.M.** July 29, 1938, as a variety for exhibition. Raised and shown by R. Thain, Esq., Hilandale, Guildown Avenue, Guildford. Plant of compact bushy habit, with stiff stocky stems. Flowers of medium size, good form, clear primrose-yellow ground, with a medium edge of light scarlet; a picotee variety, with a strong calyx.

Border Carnation 'Downs Favourite.' **A.M.** July 12, 1938, as an exhibition variety. A border variety of good form, flowers large, yellow ground fancy, heavily flaked with crimson; stem and calyx strong. Raised and shown by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath, Sussex.

Border Carnation 'Downs Glory.' **A.M.** July 12, 1938, as a variety for exhibition. A hardy border variety with flowers 3 inches across, a pale-yellow ground fancy, edged and flaked with plum-purple, and a strong calyx and stem. Raised and shown by Messrs. Allwood,

Border Carnation 'Eborian.' **A.M.** July 26, 1938, as an exhibition variety. Raised and shown by E. Charrington, Esq., Limpsfield. A hardy variety of good form and quality. Flowers 3 inches across, centre rather full, old rose ground, flaked with scarlet and maroon; calyx strong.

Border Carnation 'Elizabeth Harrison.' **A.M.** July 21, 1938, as an exhibition variety. Shown by Messrs. Gibson, Cranleigh, Surrey. A hardy variety of good habit, with stiff erect stems. Flowers of good form, centre somewhat full, yellow ground flaked and edged with scarlet-cerise, slightly scented; calyx strong.

Border Carnation 'Firefly.' **A.M.** July 19, 1938, as an exhibition variety. Raised and shown by Messrs. Allwood. A hardy border variety with large flowers of good form; flowers with pale yellow ground broadly edged and occasionally banded with rich rosy-red; calyx strong; stems stiff.

Border Carnation 'G. D. Murray.' **A.M.** July 19, 1938, as an exhibition variety. Shown by R. Thain, Esq. A hardy variety. Flowers of a pale creamy-yellow shade, much flaked with bright red, centre rather full, margins of petals slightly fringed; stems stiff, and with a strong calyx.

Border Carnation 'Lady Gay.' **A.M.** July 19, 1938, as an exhibition variety. Raised and sent by Messrs. Allwood. Flowers of

good form, rather flattish in shape, centre somewhat open, petals broad, white-edged and lightly flaked with light scarlet; stems stiff; calyx strong.

Border Carnation 'Limpsfield White.' A.M. July 19, 1938, as an exhibition variety. Shown by E. Charrington, Esq. A hardy variety, of vigorous growth, with a very strong and stiff flower stem. Flowers of large size, white, centre rather open; petals broad, of thick texture; calyx strong.

Border Carnation 'Olive.' A.M. July 5, 1938, as an exhibition variety. Shown by Messrs. C. Wall, Melrose Nurseries, Bath. Flower stems stiff and strong; flowers of good form and shape, 3¼ inches across with good guard petals and a full centre, petals of a creamy-yellow shade, narrowly edged and lightly pencilled with scarlet; somewhat scented; calyx strong.

Border Carnation 'Unique.' A.M. July 26, 1938, as an exhibition variety. Raised and shown by Messrs. Allwood. A hardy variety of good form. Flowers 3¼ inches across, centre full, cream ground flaked and narrowly edged with bright scarlet; calyx strong.

Border Carnation 'Winifred Knapton.' A.M. July 12, 1938, as an exhibition variety. A hardy border variety. Flowers rather flattish, cream ground fancy, flaked, especially towards the margins, with bright clear pink. Raised and shown by H. A. Knapton, Esq., Fairfield Road, Orpington, Kent.

***Campanula persicifolia 'Frances.' A.M.** June 23, 1938. Raised and sent by James Holding, Esq., Badsey Road, Evesham. Plant vigorous, over 2½ feet tall. Flowers semi-double, 2½ to 3 inches across, white with a faint lavender flush, margins of petals edged delicate lavender; free-flowering and of good upright habit.

Cladrastis sinensis. A.M. July 19, 1938. From Major George Johnstone, Grampound Road, Cornwall. A very graceful deciduous tree capable of attaining a height of 50 feet or more. It is a native of Central and Western China, and is perfectly hardy in the South of England. The leaves are about 8 inches long, with usually thirteen elliptical leaflets, and the small, blush-pink, papilionaceous flowers are produced in broad panicles a foot or more in length.

Deutzia Schneideriana. A.M. July 5, 1938. From Lt.-Col. L. C. R. Messel, O.B.E., Handcross. A Chinese species closely resembling *D. Monbeigii*. The glistening white flowers are borne in compact panicles of twenty to thirty at the ends of short lateral shoots produced from the previous season's growths. The leaves are 1 to 2 inches long, elliptical-lanceolate, evenly serrate, dark green above and whitish beneath.

***Dianthus Allwoodii 'Bridget.' A.M.** June 23, 1938. From Messrs. Allwood. Plant vigorous, bushy, 8 inches tall. Flower stems 6 to 8 inches long; flowers semi-double, 1¾ to 2 inches diameter, of good form, soft clear salmon-pink. Free-flowering.

* After trial at Wisley.

Dierama pulcherrimum var. 'Falcon.' **A.M.** July 19, 1938. A deep claret form raised by the exhibitors. The cut stems were about 4 feet long, each bearing six pendent racemes composed of seven campanulate flowers with pointed and somewhat spreading petals. Shown by the Donard Nursery Co., Newcastle, Co. Down.

Diosphaera asperuloides. **A.M.** July 19, 1938. From Messrs. Ingwerson, East Grinstead. This very choice alpine plant was collected in Greece by Dr. Giuseppi. It forms a close mat of shoots about 1 inch high bearing grey-green, oval leaves $\frac{1}{10}$ inch long, and star-shaped, lavender-blue terminal flowers like tiny Campanulas.

Genista aethnensis. **F.C.C.** July 19, 1938. From the Exors. of the late R. C. Notcutt, Woodbridge. The Mount Etna Broom is one of the loveliest flowering shrubs, and its late flowering season makes it particularly valuable. It was one of the first plants to receive the Award of Garden Merit, and is fully described in the JOURNAL, **48,** p. 231, and in Some Good Garden Plants (1938), p. 61, fig. 9.

Lilium × Dalhansonii, Townhill var. **A.M.** July 5, 1938. From the Rt. Hon. Lord Swaythling, Southampton. This fine variety appears to be a seedling of *L.* × *Dalhansonii.* The stout stems are 6 or 7 feet tall and bear about twenty nodding, brownish-purple flowers of medium size.

Lilium 'Grayswood.' **A.M.** July 5, 1938. From the Rt. Hon. Lord Swaythling. This very handsome Lily was found growing in the garden at Grayswood, Haslemere, and is assumed to be a hybrid from *L. umbellatum* × *L. bulbiferum croceum.* The large flowers are broadly funnel-shaped, the tips of the broad segments recurving. The colour is rich orange-yellow, with a few dark spots near the base.

Oenothera glauca. **A.M.** July 5, 1938. From Lionel de Rothschild, Esq., Exbury. A very good plant for the herbaceous border. The rich butter-yellow flowers are 2½ inches across and are widely expanded during the day. The leaves are 2 inches long, ovate-lanceolate, dark green above and glaucous beneath.

Rhododendron × 'Argosy' var. 'Snow White.' **A.M.** July 19, 1938. From Messrs. J. Waterer, Sons & Crisp, Bagshot. A very useful, late-flowering hybrid raised from the cross *R. auriculatum* × *R. discolor.* The flowers are about 4 inches across, with seven spreading and prettily crimped petals, strongly scented and arranged twelve together in a good high truss. The corolla is white, shading to ivory in its lower part. The leaf is oblanceolate, 7 inches long, dull green above, glaucous beneath.

Rhododendron facetum. **A.M.** July 5, 1938. From Admiral A. Walker-Heneage-Vivian, Swansea. Unfortunately this vivid, late-flowering species cannot be considered hardy. The flowers are bell-shaped, nearly regular, over 2 inches wide, of waxy texture and glowing scarlet colour. The truss consists of 14 to 16 closely-set flowers. The leaves are 5 to 6 inches long, light green above and loosely brown-tomentose beneath while young.

Rose 'Poulsen's Pink.' **A.M.** July 19, 1938. A pretty little Polyantha Rose with conspicuous red thorns and glossy foliage.

The clustered flowers are slightly scented, of a rose-pink hue tinged yellow at the base of the petals and becoming pale at their tips. Shown by Messrs. S. McGredy & Sons, Portadown, N. Ireland, but raised in Denmark by Messrs. Poulsen.

***Viola 'Iden Gem.'** **A.M.** June 23, 1938. From Mr. G. Murray, Staplehurst. Plant vigorous, tufted, 5 inches tall. Flowers bright violet-blue, rayed violet-purple, 1½ inch diameter. A free-flowering variety suitable for bedding.

Wahlenbergia Wettsteinii. **A.M.** July 5, 1938. From Mrs. H. P. Thompson, Weybridge, who collected it in Southern Serbia. This species forms rosettes of subulate leaves which become progressively shorter and broader towards the top. The wide hairy mauve-blue bells are borne on 3–4 inch stems, along the length of which arise short bracts.

* After trial at Wisley.

THE AWARD OF GARDEN MERIT.—XLV.*

By F. J. CHITTENDEN, F.L.S., V.M.H.

235. RHODODENDRON RACEMOSUM.

Award of Garden Merit, May 5, 1930.

It is by no means easy to select from among the vast number of species of Rhododendron those that can be recommended for general cultivation in gardens free from lime. Where lime is abundant it is better not to attempt their cultivation. Where there is sandy soil to which leaf mould or peat can be added, and better still where there is a deep bed of woodland soil with the broken shade of oak trees, there there is prospect of success if climatic conditions are favourable. Climate is an important factor, for though many, and indeed the majority, are hardy, yet their young growths are apt to be damaged, and if this happens, in most instances the flowering in the next year is doomed, and many, too, flower so early in the year that frost frequently damages the flowers even though they are produced.

Rhododendron racemosum is hardy and flowers over a rather long period in April and May. It shares with *R. oleifolium* and *R. virgatum* the peculiarity of bearing its small flowers (about an inch across) in clusters in the axils of the small leaves along several inches of the scaly shoots instead of in a single terminal truss as in most Rhododendrons. It is an evergreen species growing to about 5 or 6 feet in height and forming a small bush. It is best planted in groups and will do in the sun so long as the soil is moist. The leaves are about an inch long, generally rounded at the apex, green above, glaucous and closely spotted with brown scales beneath. The soft pink wide campanulate flowers are smooth outside (unlike *R. oleifolium* where the outside is hairy at the base).

R. racemosum is a Chinese species and the most satisfactory of the section to which it belongs for the less favoured districts of the country. A plant which has grown in the wood at Wisley for more than thirty years is still quite healthy and, as many will remember, several severe winters have tested its hardiness during that time. It is figured in the Botanical Magazine, t. 7301.

* Notes on plants which have received the Award of Garden Merit have been gathered together and published with the title Some Good Garden Plants. This can be obtained on application to the Secretary, R.H. Society, price 4*s*. Additional notes appeared in the JOURNAL R.H.S., vol. **63**, pp. 190 and 246.

GARDEN NOTE.

The Hardiness of Rosa gigantea and its Hybrids.—Coming from Burma, this rose has been considered tender, but having grown it in the open for many years where it has flowered and seeded I think this opinion should be revised. Very probably its vigorous shoots are not always ripened off in our climate, but when I grow it in a poor dry soil penetrated by the roots of other trees, it grows less vigorously and the wood ripens and flowers.

Interest has recently been taken in the hybrids of this species so well known to Riviera gardeners, such as 'La Follette,' 'Duchess of Portugal,' 'Chateau Eléonore' and the Californian 'Susan Louise.' Can we consider these hardy enough for our Southern gardeners in England?

'La Follette' has now been growing in several gardens south of London for some years and is so far undamaged by frost, and at Allington all of the above were quite undamaged, as well as *R. gigantea* itself, by the severe frosts at Easter this year, when the 'Blush China' next to them was seriously injured. I also hear of it doing well in a cold garden in Gloucestershire where it has flowered this year from early in May despite many night frosts.

I think it very probable that 'Gloire de Dijon' has *R. gigantea* blood in its ancestry and this, I learn, is quite hardy in Northumberland, so we may assume that *R. gigantea* itself is not tender in some of its forms.

A rose recently introduced from Burma by Mr. COOPER, as yet unnamed, is in appearance intermediate between *Rosa gigantea* and *R. laevigata*. This has been growing for several years at Haywards Heath in the National Rose Society's garden and flowers freely. It was quite uninjured when *R. macrophylla* was cut to the ground.

We may perhaps admit that Burmese plants, probably from the higher altitudes, need not necessarily be tender.

E. A. BUNYARD.

BOOK REVIEWS.

"The Garden To-day." By A. T. Johnson. 8vo. x + 195 pp. (My Garden, London, 1938). 8s. 6d.

In view of the present output of new books on every branch of horticulture it is no easy matter to select a title which can truly be said to be apt and descriptive of the book itself. Such, however, is The Garden To-day, for the author deals in an intimate and thoroughly practical manner with recent developments in gardening taste and with the newer introductions in shrubs, rock garden plants and so on. It is, however, by no means a treatise on new plants, for throughout the book old favourites receive their full share of appreciation; chapters are devoted, for instance, to the Flowering Currants and Forsythias.

There are few phases of outdoor gardening on which the author has not some interesting comment to make. Cherries, Magnolias, Primulas, Meconopsis, etc., all come in turn under the spotlight. He commends the modern tendency towards economical planting, and strongly favours the use of "permanent" plants, such as Iris, Lilies and Pæonies, and the liberal use of flowering shrubs in conjunction with herbaceous planting. For naturalizing and bold grouping he stresses the value of the Rose species and single-flowered hybrids of the Moyesii group. Considerable care is taken to keep the names used so far as possible up to date and to correct long-standing errors in garden names. In a few cases, however, names are retained which have for years been wrongly applied. In *Caltha polypetala*, for example, the author is obviously referring to the garden plant of that name (*C. palustris stagnalis*), not the true species; and again, in *Tulipa dasystemon* he refers not to Regel's plant of that name but to *T. tarda* Stapf; again, it is fairly certain that in *Pentstemon Roezlii* he means the scarlet-flowered species which masquerades under this name, not the true plant, which is blue.

The arrangement of the book is excellent; it may perhaps be best described as a monthly review of the garden year, for we are shown month by month the high lights of the garden whether they happen to be alpines, the wild garden, waterside plants or autumn colour. The illustrations also are an interesting selection, covering almost as wide a field as the book itself; they are all plants which have proved their value and their suitability for the vast majority of gardens.

G. W. Robinson.

"Everyman's Wild Flowers and Trees." By Miles Hadfield. Illus. 8vo. 192 pp. (Dent, London, 1938.) 6s.

It is difficult to criticize a book which so exactly achieves, as this does, what it sets out to accomplish. Everyman's Wild Flowers and Trees is a selection of five hundred plants that are wild or naturalized in Britain. Many such selections have been published, but this one must settle down straight away at the head of them, and it is likely to remain there.

Every plant has been illustrated, and nearly four hundred of them by reduced coloured facsimiles from Sowerby. The effect is charming; but Sowerby's colours are apt to be eccentric, and I am not sure that the author's own drawings for the remaining hundred or so plants may not be more helpful to the amateur. There are full descriptions, and botanical terms are explained in an introduction, the admirable lucidity of which will be expected by those who have read Mr. Hadfield's contributions to his own book, The Gardener's Companion.

A selection is difficult to make, and easy to blame. But I cannot help regretting certain omissions, the marsh orchids for instance, which are more likely to be encountered than the frog orchid, which is included. *Geranium sanguineum*, too, *Polygonum Bistorta*, and *Leucojum aestivum* are absentees which I deplore. And considering the numbers of people who go hiking on the mountains, the alpines seem to have been too lightly passed over. *Viola lutea* and *Salix herbacea* have been omitted, together with *Saxifraga hypnoides* and *S. stellaris* (both of them commoner than the deservedly included *S. oppositifolia*); and it seems a pity that room could not have been found for *Gentiana verna*, and *G. Pneumonanthe*.

But my one serious grouse is over a matter of nomenclature. I am disappointed to find a man of Mr. Hadfield's taste and scholarship seeking to establish

a horrid modernism. He assigns the name ' sun-rose ' to *Helianthemum Chamaecistus* (*vulgare*), adding that ' Rock-rose ' " should be restricted to *cistus*." This is a statement for which I can find no justification. Cistus is an *English* word, once applied to all members of the now divided genus Cistus, which formerly included Helianthemum. ' Rock-rose,' according to the Oxford Dictionary, while vaguely applicable to members of both genera, is especially used for the very species of Helianthemum to which Mr. Hadfield denies it. Plant names are confused enough already, and why not, when speaking English, continue to call a Cistus a Cistus, and go on calling a Helianthemum as it has been called for some two hundred years, a ' Rock-rose ' ?

GAYTHORNE HARDY.

" A Gardener's Progress." By Dr. F. Stoker. 8vo. 457 pp. (Putnam, London, 1938.) 15*s*.

From small beginnings and blind ignorance to a lovely garden and wide knowledge is the gambit of Dr. Fred Stoker's pages. It is a book entertainingly full of wisdom as to plants, of humour at his mistakes in the early stages, and of sound advice to those who are following the same arduous though pleasant occupation of creating beauty out of ugliness, or order out of chaos left by some predecessor. I do not know which is the harder task, to create from the start, or make good the sins of those who went before. On the whole I am not sure that the first task is not in some ways the less arduous because, at least, there is not the uprooting of horrors that have eaten all the good out of the soil and left unwelcome seedlings sprouting in all directions. Dr. Stoker had a taste of both classes of gardening between the early days of Ackling and these serene ones of Loughton where he and " Mary " have created a thing of beauty and interest to all those who love good plants, good cultivation and a good display of these results ; this latter essential is sometimes missed in a collection of admirable plants and they thereby lose much of their charm. In the Loughton garden every use has been made of opportunities, and under the pines is a treasure house of rare and lovely things of the humble-minded type which seek the semi-shade of seclusion from their more invasive brethren.

How wise he has been, and is, to try out plants in that gentle half-shade. I wish more people did so instead of taking it for granted that because a plant comes from some hot country (as compared with England) the poor thing must be thrust into the full glare of a hot sun in a baked-out piece of ground. I have fallen into that error many times in years gone by, and have lamented the abrupt demise of a treasure that would probably have survived but for the idea that scorching was needed.

Dr. Stoker's early efforts remind me very much of a remark my husband was wont to make in my earlier days when asked how the Thorpe garden progressed. He would say with a chuckle, " What was isn't, and what is won't be," which was the point of view of the non-gardener to experiments of various kinds. So with Dr. Stoker—he too tried and changed, upheaved soil in one direction to cart it to another, made a pond and filled it up again, and had no end of a good time playing round with experiments of which he tells us in his dry, humorous fashion. But in the end came success, and the shrubs and trees at Loughton are now established and big, the rock garden well furnished, and the greenhouses always a source of green-eyed jealousy to me when I visit them and generally return with a nice lot of loot, for Dr. Stoker believes, as I do, that the giving of plants is not only a pleasure to the giver as well as to the recipient, but bread upon the waters in the event of failure of some rare specimen, for then one knows where to send an S O S, whereas the dog-in-the-manger gardener frequently gets left minus the plant and without a grateful recipient to fill the gap.

Throughout the pages of this book information is sprinkled so cunningly that knowledge is absorbed without our realizing it, and therefore it sticks in one's mind more readily because it has not been the result of a dull lesson. There are little items as to the why and wherefore of certain names, a warning against the impatience of the gardening novice, the pitfall that leads more advanced ones to rush into " difficult plants " out of the sort of vanity which rather besets us gardeners I fear. He has a tilt at catalogues which depict astounding herbaceous borders with everything blooming at the same time and forming a riot of colour that catches the beginner's eye and he—poor devil—ignorant of the mendacity of some of these pictures, dreams of creating just such a masterpiece. What a shock he gets ! The few words on staking made me laugh, " gathering the branches to the support and tying them to it in a bulging bundle to form a herbaceous shaving brush." How often one has suffered from it when the young gardener gets loose and wants to " get through with the job," for it is the pro-

fessional no less than the amateur who is a great offender in the staking line, as I well know, having fought pitched battles without end on this thorny subject. Another tilt, in which I am whole-heartedly agreed with the author, is the question of colour descriptions " None (gardeners) are more expert at finding a chalky blue cerulean, a doubtful pink incarnadine or a washy magenta the purest heliotrope, nor less hesitant in voicing their interpretations." There is an amusing item when a New Zealander talked about a ' Mountain Lily ' and after the matter was run to ground it proved to be *Ranunculus Lyallii*, which reminded me of an experience in Canada when I was told a great deal about the masses of Crocus I should see on the Prairies when crossing them in early summer. I looked everywhere for them only to find that these famous Crocus were *Anemone Pulsatilla*, which abounded on the dry railway banks. Evidently the dwellers in the other Dominions besides Canada are apt to attach wrong names to their native wildings.

To those who know " Fred and Mary " the book is a vivid reminder of a lovely garden and a charming pair of enthusiasts, for though " Mary " often keeps in the background, she is as good a propagator as her husband, and at one time there was a small greenhouse entirely her own, which she guarded with the ferocity of a tigress for her whelps, both from the intrusions of " Fred " and the gardener who used to stand timorously on the threshold unless bidden to enter and see the proprietor's achievements.

EVELYN BYNG OF VIMY.

" Soilless Growth of Plants." By Carleton Ellis and M. W. Swaney. 155 pp. 58 figs. (Reinhold Publishing Corporation, New York; Chapman & Hall, London.) $2.75 (13*s.* 6*d.*) net.

A great deal of interest has been aroused during the past year or eighteen months in the so-called " tank culture " of plants, as a result of articles in the press and items in news films giving accounts of almost incredible yields of crops purporting to have been obtained in the United States by this method. As so often happens when an idea of this kind is seized upon by the popular newspapers the accounts were frequently garbled and the impression was given that the cultivation of plants in tanks of nutrient solutions was a simple process which could be followed by any amateur in his backyard with certainty of phenomenal results.

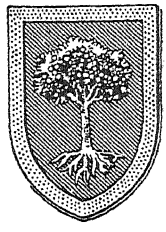
This volume, by two authors who have made a special study of the possibilities of the method, comes at an opportune time to clear up many of the popular misconceptions. The authors are the first to point out that there is nothing new in the growing of plants without soil. Sand and water cultures have been used for many years by plant physiologists for the growing of plants under exact nutrient control, and thus for investigating the details of plant nutrition. The " enormous surge of popular interest in this art " to which the authors refer is solely due to the recent attempts both in America and in this country to use the method for practical commercial purposes. The authors take pains to point out that the growing of plants without soil is certainly no easier than the traditional methods and that it presupposes as much, if not more, knowledge of the needs of plants for successful growth.

The book is a clear and concise discussion in non-technical language of the various methods which have been employed for the growing of plants in sand, gravel, cinders or other materials, or in nutrient solutions without a supporting aggregate. After an introduction which should be read carefully by anyone considering experimenting along these lines, the first chapter is devoted to a brief account of the chemistry of plant life, which is a model of non-technical exposition. Succeeding chapters give details of the sand-culture methods, sub-irrigation systems and the water-culture method, with full instructions for the apparatus required. Chapter 4 gives interesting suggestions for methods which might be employed by the amateur, while in Chapter 5 the commercial aspects are discussed and it is pointed out that the chief advantages likely to accrue are not so much greatly increased yields as the more precise control of plant growth, and therefore the greater uniformity of cropping. Chapter 6 gives an interesting, though brief, account of the uses of special chemicals, especially the so-called " plant hormones " and colchicine, the chemical which has been found to induce chromosome doubling.

To the amateur experimenter who may find access to the original literature difficult, the last chapter will be of particular value, as it contains details of some of the nutrient solutions which have been successfully used, with the quantities of the various chemicals translated into terms of weights and measures available in every household.

R. H. STOUGHTON.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXIII  Part 10

October 1938

FORTHCOMING EVENTS.

FELLOWS and Associates of the Society are reminded that friends who are desirous of joining the Society, if they are elected now, will be able to enjoy the privileges of Fellowship or Associateship for the remainder of this year and will not be required to pay a further subscription until January 1, 1940.

The year is passing very quickly, but nevertheless there are quite a number of interesting shows and lectures to be held, as will be seen from the following calendar:

A Fortnightly Show will be held on October 11 (12 noon to 7.30 P.M.) and October 12 (10 A.M. to 4 P.M.) in the New Hall.

In the Old Hall on October 11 (1 to 7.30 P.M.) and October 12 (10 A.M. to 4 P.M.) the Fruit and Vegetable Show will be held. At this Show there will be a special exhibit from Wisley of Pests and Diseases of Fruit and Vegetables. The schedule of this Show can be obtained from the Secretary. (See also p. 454.)

At 3.30 P.M. on October 11 a lecture on "Thirty Years an Exhibitor, and Advice to Young Exhibitors" will be given by Mr. A. E. Usher.

A Fortnightly Show will take place on October 25 (12 noon to 7.30 P.M.) and October 26 (10 A.M. to 4 P.M.), and it is usual on this occasion to find berried Shrubs, Orchids, Stove and Greenhouse Plants well represented.

The following Orchid competitions will take place for Trophies presented by the Orchid trade:

(*a*) A Silver Trophy for the best twelve Orchids, not more than two of any one genus, exhibited by an amateur who employs not more than two growers, including the head gardener, in his orchid houses.

(*b*) A Silver Trophy for the best six Orchids exhibited by an amateur who employs not more than one orchid grower or gardener.

Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than by the first post on Wednesday, October 19.

Fellows are warned that Fellows' tickets will not admit them to the National Chrysanthemum Society's Show on November 3 (1 to 7.30 P.M.) and November 4 (10 A.M. to 5 P.M.).

The Masters Memorial Lectures for 1938 are to be given by Mr. F. J. Chittenden, F.L.S., V.M.H., on "The Behaviour of Plants." The first will be given at 3.30 P.M. on October 25 and the second on November 8.

A Lily Group Discussion will take place at 4.30 P.M. in the Restaurant of the Old Hall on October 25 on "Raising Lilies from Seed."

The Presidential Address of the Institute of Landscape Architects will be given at 3 P.M. on October 26 in the Lecture Room of the New Hall. Fellows interested are invited to attend.

A Fortnightly Show will be held on November 8 (12 noon to 5 P.M.), and on this occasion the following Flower Arrangement Competition for amateurs will be held:

> One vase, bowl or other receptacle of cut flowers and/or ornamental fruits arranged by the exhibitor in the exhibition hall without any assistance. Any natural foliage may be used, but no artificial, dyed or surface-coloured flowers, fruits, or foliage, ribbon, coloured paper or other decorative artificial material may be included in any exhibit. The material used need not have been grown by the exhibitor. For further details, see special regulations for the competition, obtainable from the Secretary.

On November 9 and 10 (2 to 4 P.M.) a Demonstration will be given at Wisley, weather permitting, on the Planting of Fruit Trees and Roses.

On November 29 (12 noon to 5 P.M.) a Fortnightly Show will be held in the New Hall. The British Carnation Society will hold their Show in the Old Hall on November 29 (1 to 7.30 P.M.) and on November 30 (10 A.M. to 5 P.M.).

At 3.30 P.M. on November 29 Dr. M. A. H. Tincker will lecture on "Growth Substances and Horticultural Practice."

Competitions at the Fruit and Vegetable Show.

Four Challenge Cups will be competed for at the Fruit and Vegetable Show to be held on October 11 and 12:

1. The Gordon-Lennox Cup, which is offered for the most meritorious display of fruit staged by an amateur in the competitive classes.

2. The George Monro Memorial Cup, which is offered for the best exhibit of Grapes staged by an amateur.
3. The Affiliated Societies' Cup for Fruits, which is offered for the best exhibit of fruit staged by an Affiliated Society.
4. The Society's Vegetable Challenge Cup, which is offered for award to the competitor who secures the greatest number of prize-points in the classes for vegetables.

The following cups are offered for award outright:

The Riddell Trophy, which is offered for award to the competitor who is placed first in the class for a table of vegetables.

The Sutton Vegetable Cup, which is a silver cup, presented by Messrs. Sutton & Sons, of Reading, and is offered for the best exhibit of twelve distinct kinds of vegetables shown by an amateur.

Full particulars in regard to these cups are given in the special schedule.

Pictures, Plans, Photographs, etc.

With the approach of winter, space will be available at Fortnightly Shows for pictures and photographs of plants, flowers and gardens, and for plans or models of gardens. Regulations with regard to these exhibits may be had on application to the Secretary. The dates of the Shows when these exhibits are permitted are November 8, 29, December 13, 1938, January 10, 24, February 7 and 21, 1939.

Horticultural Sundries.

The exhibition of Horticultural Sundries will be allowed at the Fortnightly Shows in December and January. If space is available, sundries will also be admitted on November 29.

Unattended Exhibits.

Attention is called to the rules for unattended exhibits. The Society's officers will, if necessary, unpack and stage small exhibits if the Secretary has been notified beforehand of their coming, and if the owner is unable to accompany them, but in no case can the Society undertake or be responsible for their repacking and return.

Lily Group.

The Lily Group consists of Fellows and Associates of the Royal Horticultural Society who are especially interested in Lilies, Nomocharis and Fritillaries. Its object is to provide members with facilities for meeting to exchange views upon these plants. Those who wish to join should apply in writing to the Secretary, who notifies members by post of all meetings.

Hall Lettings.

From October 17 to 21 the Medical Exhibition will be held in the New Hall, and interested persons are asked to apply to the organizer, R. S. Ely, Esq., 194–200 Bishopsgate, London, E.C. 2, for particulars.

A Charity Bazaar in aid of the Ladies' Association of Princess Elizabeth of York Hospital for Children is to be held on October 19 and 20 in the Old Hall. Further particulars may be obtained from Miss Hornby, 1 Greycoat Street, Greycoat Place, Westminster, S.W. 1.

A Missions Sale of Work will be held in the Old Hall on November 16 and 17, particulars of which may be obtained from Mr. A. W. Bartlett, 6 New Square, Lincoln's Inn, W.C. 2.

"The Women's Institutes Exhibition" will be held in the New Hall from November 16 to 23. Particulars may be obtained from the Hon. Frances M. Farrer, National Federation of Women's Institutes, 39 Eccleston Street, London, S.W. 1.

On November 23 and 24 Our Dumb Friends' League will hold their Annual Fair in the Old Hall. Inquiries should be addressed to the Secretary, Our Dumb Friends' League, 72 Victoria Street, S.W. 1.

Wisley in October.

Of the plants on trial this year only the early-flowering Chrysanthemums, Michaelmas Daisies, and, if the frosts of autumn permit, the Dahlias will still have bloom to show this month, but of each of these there are large collections of the most recent as well as older varieties. All are situated in the Trial grounds near the entrance gates.

In the beds beside the Alpine house grow the Crocus species, of which some such as *Crocus speciosus*, *C. laevigatus* and *C. longiflorus* produce their flowers in the autumn and are cultivated in the rock garden. In the latter place will be found the double white *Colchicum autumnale album plenum*, the yellow, Crocus-like *Sternbergia lutea*, and the early Snowdrop, *Galanthus Olgae*, whilst several species of Cyananthus, Polygonum and Gentiana, together with the useful South African *Schizostylis coccinea* carry their flowers until severe frosts finally put an end to them. When this occurs the Japanese Maples at the top of the alpine meadow and the two large trees of *Amelanchier canadensis* don their colouring of yellow, red or scarlet, and for a short time make a most attractive picture.

In the Wild Garden the signal of the year's decline is to be seen by degrees on a number of trees and shrubs. These include Azaleas, Vacciniums, *Disanthus cercidifolius*, Enkianthus, Fothergilla, Hamamelis, and Maples, besides the Royal Fern, *Osmunda regalis*, and according to the season and weather conditions this display continues until approximately mid-November.

Shrubs growing in Seven Acres which should be included in this category are the Berberis, Euonymus, *Parrotia persica*, *Cercidiphyllum japonicum* and Cornus, so that Fellows who purpose adding such to

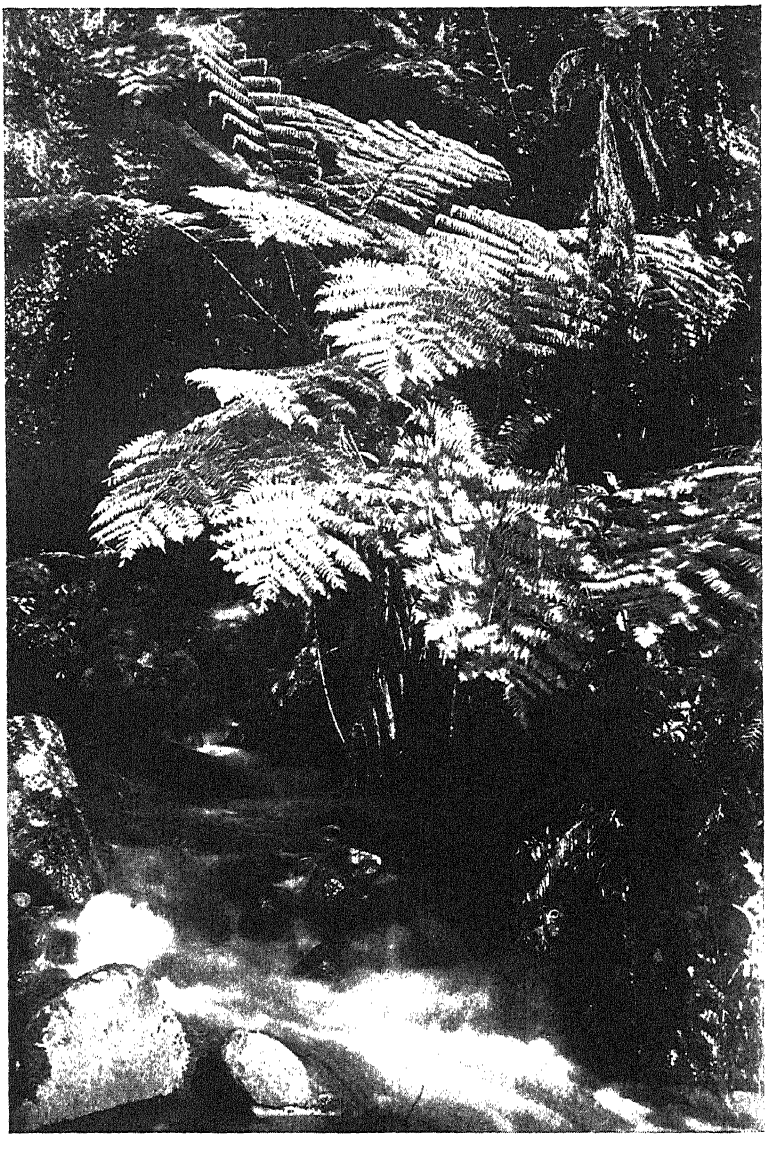


FIG. 126.—TREE FERNS IN THE NYAMGASANI VALLEY, RUWENZORI.

[*To face p.* 456.

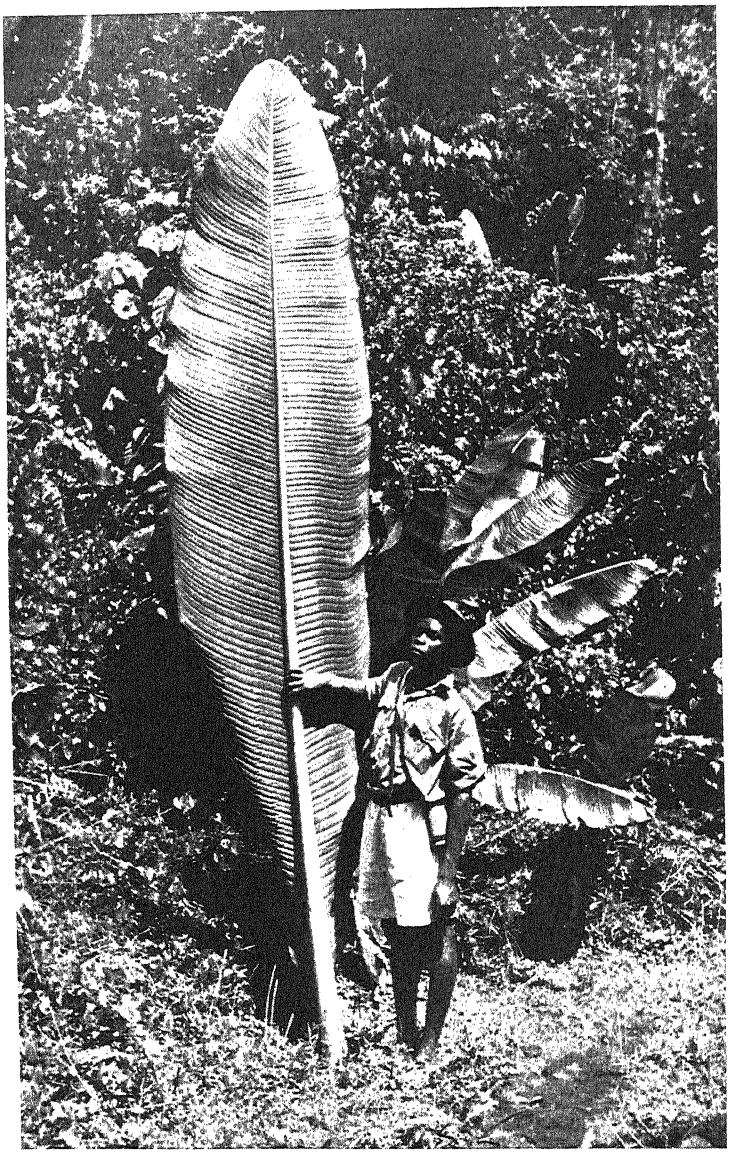


FIG. 127.—A LEAF OF THE WILD BANANA, MUSA ENSETE.
FROM 7,000 FT. ON MT. RUWENZORI.

their gardens should make a point of seeing Wisley during this period.

Flowers in the Heath garden will be fewer by this time, but the Connemara (*Daboecia cantabrica*) and Cornish Heaths (*Erica vagans*) generally extend their season until this month, and the russet tones of the dying heads of the latter in particular have a beauty of their own.

Many of the shrubs especially grown for their berries are also to be found in Seven Acres, of which Cotoneasters, Berberis and Euonymus may be mentioned; the Rose species are placed together along the river bank in Howard's Field, and many of the Viburnums are in the collection at the northern end of the Azalea garden. In the last also is a wide border of the invaluable *Gentiana sino-ornata* which flowers throughout October, and in the early part of the month at least the neighbouring herbaceous border should not be overlooked. An unusual shrub which flowers at this season is in the Award of Merit Garden, *Schima argentea*, a near relative of the Camellias from China.

Within the large Temperate house several shrubs will draw attention. The royal purple Tibouchina, bright red *Epacris ardentissima*, the white scented flowers of Stephanotis, rosy trumpets of Lapageria, and the first of the Acacias are some of these, whilst Passion fruits and those of the 'Tree Tomato' (*Cyphomandra betacea*) are likely to be hanging from their respective plants. In the half-hardy house Nerines will be a feature, and on the south wall of the propagating pits the interesting hybrid *Grevillea* × *semperflorens* bears its delicate peach-coloured blossoms.

AN EXPEDITION TO THE MOUNTAINS OF THE MOON.

By PATRICK M. SYNGE, M.A.

[Read March 22, 1938; Sir A. D. HALL, F.R.S., V.M.H., in the Chair.]

WHEN we consider the very striking and decorative characteristics of many of the plants from the Equatorial mountains of East Africa it seems surprising that not a single one of them is in general cultivation in England to-day either as a hardy plant or as a greenhouse plant. Coming from altitudes very similar to those at which some of our most successful garden plants have been collected in the Himalayas we might have expected a different story.

On these mountains we found some of the strangest and most weird plants that I have ever seen. Although not lunar in fact, they well lived up to that name in appearance and the whole landscape was most unearthly. We saw arborescent Senecios (giant Groundsels) swollen and distorted with woody trunks 20 feet high, Lobelias like gigantic blue and green obelisks and Heathers mighty as great trees. Most alpine plants are reduced to extreme dwarfness, but these have rushed to the opposite extreme and exhibit an exaggerated gigantism.

The Equatorial mountains of East Africa include Ruwenzori 16,794 feet, Mt. Elgon 14,172 feet, Mt. Kenya 17,036 feet, the Birunga or Mfumbiro volcanoes (Muhavura 13,483 feet), the Aberdare mountains (Kinangop 12,845 feet) and Mt. Kilimanjaro 19,313 feet. During a year spent recently in East Africa with an expedition organized for the purpose of studying the flora and fauna of these mountains, I was fortunate enough to visit and ascend to the higher zones of all those mentioned above with the exception of Mt. Kilimanjaro and those of the Mfumbiro volcanoes which are wholly in the Belgian Congo. In this paper I would, however, like to confine myself for the greater part to Ruwenzori, the "Mountains of the Moon," and Mt. Elgon, an extinct volcano which contains one of the largest craters in the world.

All these mountains stand up like islands from the surrounding warmer plain, islands of peculiar vegetation which would seem to be a relic of a flora formerly much more widely spread. It is a curious fact that many of the genera on these mountains, and even a few of the actual species, are similar to those found in England. High up on Ruwenzori we found a white Sanicle similar to that found in many English woods, while on Elgon there was a little Violet very like our wild English Violet, though without any scent. The same curious affinities were observed in the insects, particularly the insects associated with the giant plants. Both plants and insects are totally different from those found in all other parts of Africa, with the exception of some of the higher parts of Abyssinia.

The earlier explorers of Ruwenzori had walked from the coast, but now there are good roads throughout most of Uganda and it is possible

to reach the base of the mountain by car in one day from Kampala, the capital of Uganda, which is connected with Mombasa by rail and also has an airport only four days from London. But even so parts of the mountain are comparatively unknown and we were able to ascend a big valley, the Nyamgasani, which had not been previously ascended. We had to cut a path practically all the way through dense growth. We visited Ruwenzori during December and January and were unusually fortunate in experiencing two months of continuous fine weather while practically every former traveller has recorded nothing but continual rain, mist, cold, hail, snow and every form of damp misery.

Before we consider the plants in detail I would like to describe very briefly the vegetational zones of Ruwenzori and some of the environmental factors under which the plants grow. On each of the mountains the vegetational zones are very well marked. Every change from one zone to another is abrupt and in most instances each species is found in only one zone or even within a narrower altitudinal range than is represented by the whole zone. In the Nyamgasani valley of Ruwenzori the mountain vegetation began above 6,000 feet and the zones were roughly as follows :

6,000 to 7,500 feet was mixed evergreen rain forest. This forest is particularly thick and luxuriant beside the streams down which it stretches great tongues into the elephant grass and bracken. In this zone, as far as we could discover, the temperature never descended below freezing point and so there is little hope that the plants would be generally hardy except in very sheltered and mild parts of England. The majority are more tropical than temperate in appearance. Conspicuous in the undergrowth are the tree ferns, *Cyathea sp.* (fig. 126), and the wild Bananas, *Musa Ensete* (fig. 127). These wild Bananas bear no edible fruit but instead large hard seeds, like rounded beans, which germinated freely. I have grown several in a small greenhouse in Surrey until they got too big and touched the roof. In the forest the leaves were largely untorn and did not present the tattered appearance of the common Banana. Although often 10 or more feet in height, the plants were practically trunkless, the leaves arising from a great cradle formed by the old leaf bases, to which age had imparted a dead crimson colour. Beside the small plant presses these leaves indeed presented a botanist's dilemma. We found many such dilemmas on the mountain.

From 7,500 to 10,000 feet extends the bamboo forest. In the lower zones the bamboos are very large, reaching a height of more than 50 feet, but between 9,000 feet and 10,000 feet they decrease gradually in size until they are no more than 15 to 20 feet in height. Around the streams here we found the magnificent scarlet Amaryllid, *Choananthus cyrtanthiflorus*, and a fine green and white Arisaema.

Almost exactly at 10,000 feet there is an abrupt change into the heather forest zone, the *Ericetum*, that zone which gives Ruwenzori its most peculiar and unearthly vegetation. In Borneo I had found

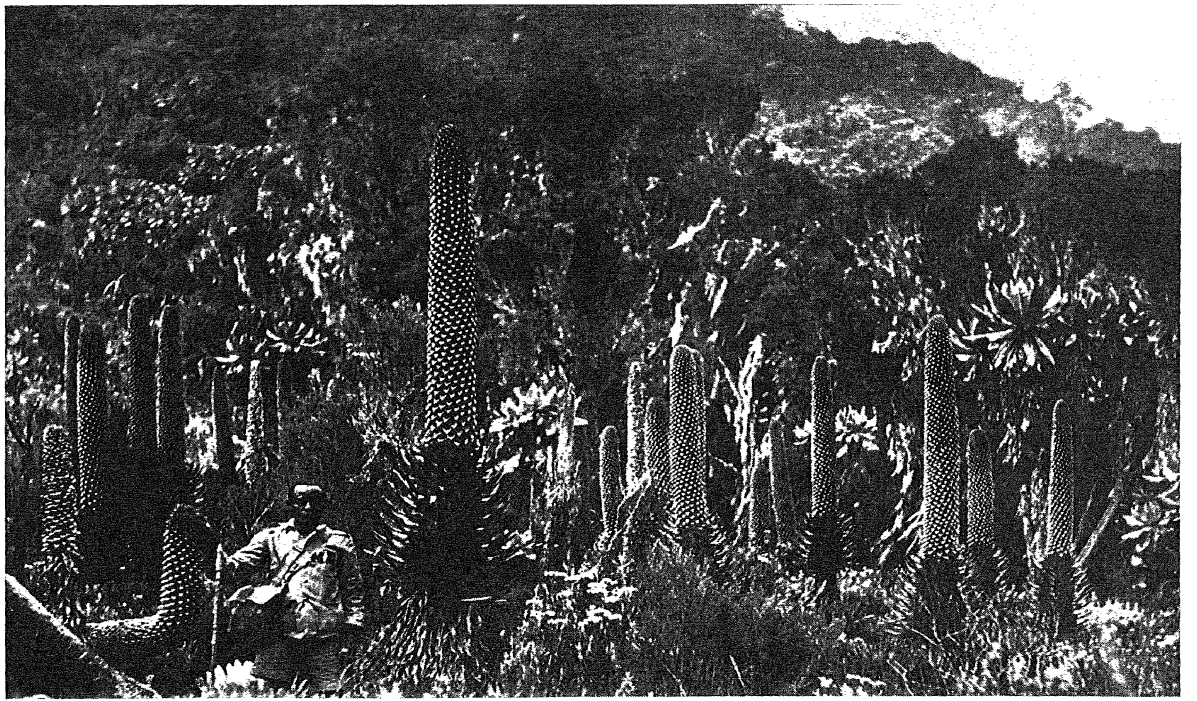
a similar abrupt transition at 4,000 feet on Mt. Dulit, between the evergreen rain forest and the moss forest, and I believe that such a character is common in tropical mountain floras.

Some have called all the Ericetum a sub-alpine zone and the bare rocks, snows and glaciers higher up alpine. Others have called all this zone alpine, but the term does not seem to me wholly appropriate. Between 10,000 and 13,000 feet the heathers *Erica arborea* and *Philippia Johnstonii* are very large, being often 40 or 50 feet in height and having trunks several feet in circumference. In this zone is the chief growth of the arborescent Senecios and the giant Lobelias. On all the trees and covering the ground thickly is a very dense growth of Mosses, Liverworts and Lichens. Some were brilliant yellow, others deep crimson in colour. Every shade of green was represented. The tree trunks were also clothed in thick Moss, often tussocked into the semblance of faces, while from their branches dangled long streamers of a pale sulphurous yellow Lichen, the old man's beard.

In the Ericetum the soil is an inky-black, waxy, somewhat gravelly peat, which is very acid. There is, as far as we found, no fully developed podsol such as is often developed in heathlands in Europe. While practically all this zone is very damp, in many places there are large open patches of regular swamp in which raised tussocks of *Carex runssoroensis* are dominant. In these open patches of swamp the green spiky *Lobelia Bequaertii* (fig. 128) with the large purple rosettes is found, while in the forest and in drier open patches the silvery-blue *L. Wollastonii* (fig. 129) is common. The latter species ascends higher than the tree heathers and is found up to 14,700 feet, where there is little other vegetation than Black Lichen covering the rocks and an occasional tuft of grass. The arborescent Senecios (fig. 130) also are found both in the heather forest and in the open places up to 14,500 feet (fig. 131).

The environmental factors under which this extraordinary vegetation has developed are undoubtedly complex. They certainly include a very high humidity: in the case of Ruwenzori an almost perpetual damp season with only very occasional dry spells. This fact may be due partly to the exposed situation and great height of the mountain and partly to the influence of the great Ituri forests on its western side. A high altitude is combined with a high ultra-violet light intensity, due to the factors of the tropical position and height. This light factor may, however, be somewhat masked by the very frequent mists which cover the mountain.

All these factors, the high humidity, the perpetual dampness, the high altitude and the possibly high ultra-violet light intensity, are also combined with a low temperature, varying little throughout the year, and a very acid soil. These last two factors would tend to restrict growth and their influence can be seen in the very short internodes of the arborescent Senecios, the giant Lobelias and the almost arborescent Peucedanum. The great luxuriance of foliar growth, combined with ultimate size, may partly owe its existence to the former factors



[*Photo : G. L. Hancock.*

FIG. 128.—LOBELIA BEQUAERTII AT 11,000 FEET ON RUWENZORI.
Flowers dark blue.

[*To face p.* 460.

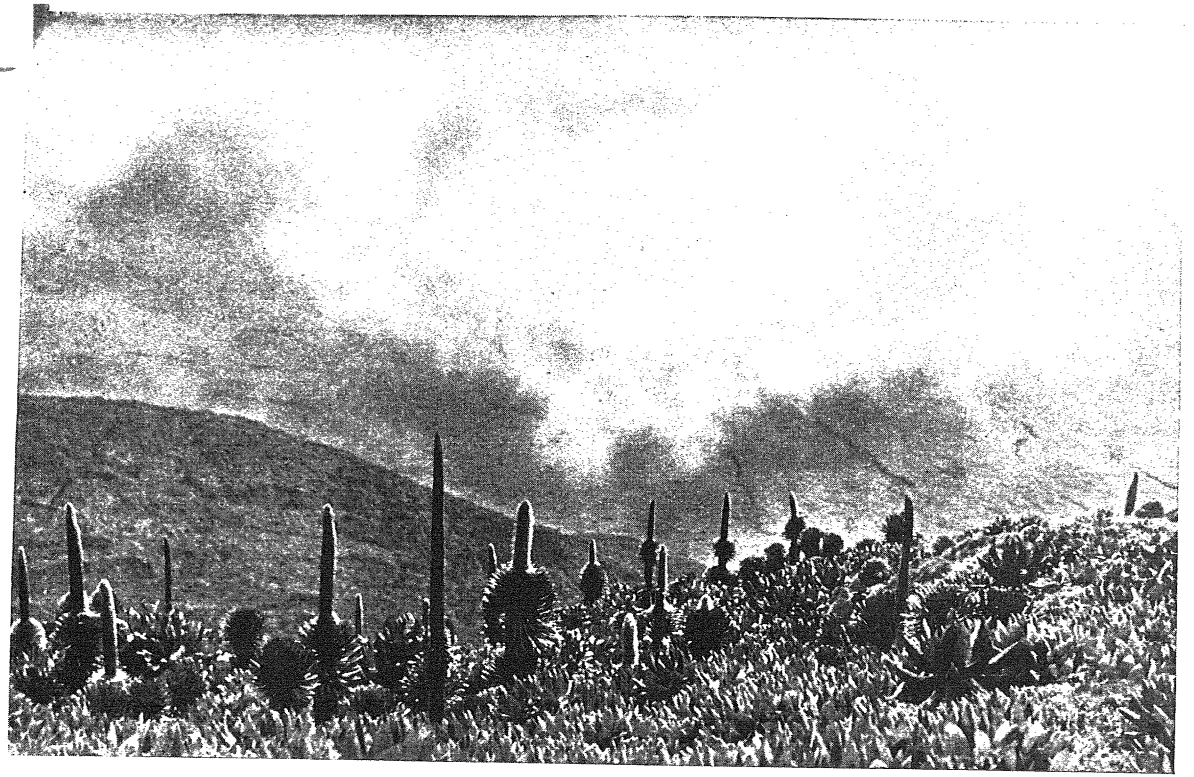


FIG. 129.—LOBELIA WOLLASTONII.

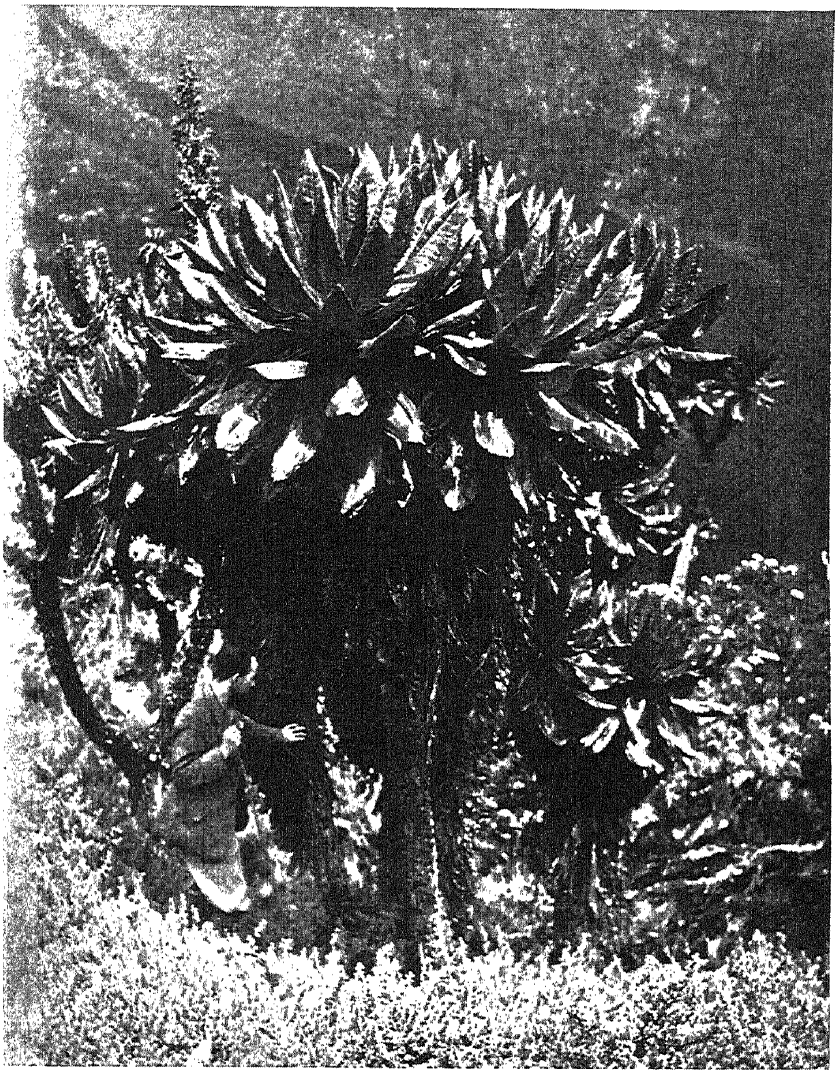


FIG. 130.—SENECIO ADNIVALIS ON MT. RUWENZORI.

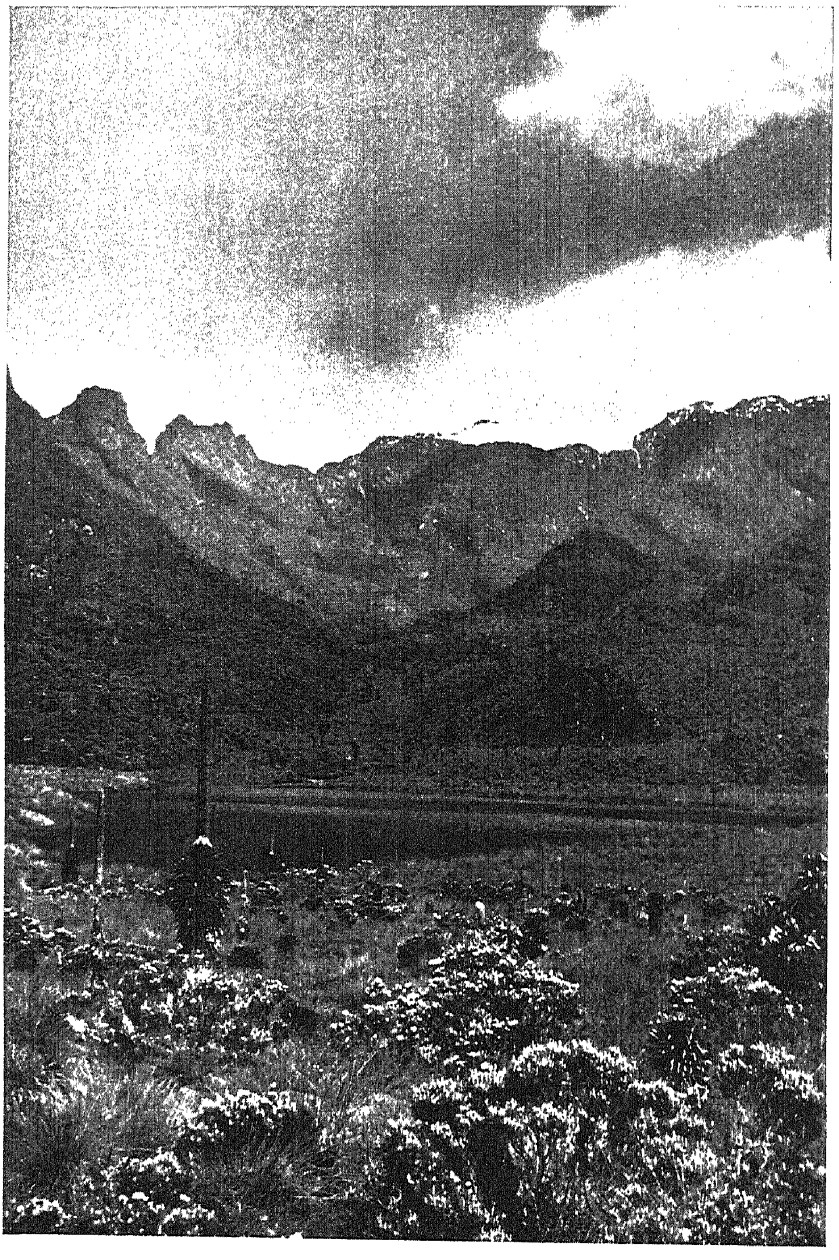


FIG. 131.—LAKE ON RUWENZORI WITH LOBELIAS, ETC., IN FOREGROUND.

[*To face p.* 461.

combined with the lack of definite seasons. On Ruwenzori all the year is a growing season.

On Mt. Elgon there seem to be two short but definite dry seasons in the year. Unlike Ruwenzori, which is made up of very ancient rocks, Mt. Elgon is an extinct volcano, and has a large expanse of open grassland above 10,000 feet, very similar to Dartmoor, except for the tree heaths and the giant Senecios and Lobelias. On Elgon, however, the Senecios and most of the species of Lobelia are found in dampish patches and close to streams. The same is noticeable on Mt. Kenya and the Aberdare Mountains, which have somewhat similar expanses of moorland to Mt. Elgon and are also extinct volcanoes. In this grassland are found numerous little bulbous plants which are quite absent from Ruwenzori and the flora is considerably richer in numbers of species. Although there are patches of very acid, black bogland on Elgon it is probable that the general ground is not nearly so acid as on Ruwenzori. Up to 10,000 feet there is much the same sequence of mixed evergreen and then bamboo forest, although on Elgon now much of the original forest has been cleared and a scrub of Everlastings (fig. 132) has grown up in its place. We have found that plants from Mt. Elgon seem generally more vigorous in growth and more adaptable to the conditions of this country than are plants from Ruwenzori.

Although in their native habitat many of the plants must withstand prolonged periods of frost, it has been found that in this country they are happiest in the south and west, particularly in the west of Scotland where the weather is mild and, probably even more important, the atmospheric humidity is high. It has been found possible, though, to winter successfully out of doors in Surrey, just with the aid of hand cloches, four different species of giant Lobelia, which are still in the rosette stage, but all of which are flourishing. Another factor in the successful cultivation of these plants seems to be the provision of ample root space and also an absence of root disturbance. For the most part they seem to do better in the open than under glass.

Among the many plants of the mountains the following seemed to be some of those most interesting for horticultural purposes.

Giant Lobelias.

These species belong to the Rhynchopetalum series of the genus Lobelia and are found on all the East African mountains both in the forest and alpine zones. A full account of the group will be found in a paper by Miss E. A. Bruce in the Kew Bulletin, No. 2, 1934, so I will only give some short notes here from my personal experience of them.

Lobelia giberroa.—This is the largest species of all and is the only species common to all the mountains, ranging from 6,500 to 10,000 feet, but not emerging into the alpine zone. It is really a plant of the forest glade and of the forest edge. On Mt. Elgon we found it in the bamboo forest at 9,000 feet. Some of the plants were in flower and had

reached a height of 29 feet. A more usual height is 15 to 20 feet. The flowers form a dense raceme, often 10 feet in length. Unfortunately they are greenish-white and partially hidden by linear green pendulous bracts which are larger than the flowers.

This species grows fairly easily from seed and has several times been raised in England. It has recently flowered after six years' growth at Kew in the temperate house. Being a plant of the forest it will not stand any frost, even though it may be protected with bracken, but in Surrey we have found it easy to grow in a cool greenhouse, moving the plants outside for the summer, and in two years from seed it has attained a height of 4½ feet. The leaves are very large and form a loose rosette on the top of a lanky stem. They have a prominent purple midrib and purple venation, which give them their chief attraction. Its bulk and its coarseness of growth make this probably the least attractive and interesting of the giant Lobelias from the horticultural viewpoint. It is, however, probably the easiest to grow provided that there is sufficient room to winter it in a cool greenhouse and that it can be given ample space.

L. aberdarica.—Grows abundantly in open swamp by Bulambuli stream at 9,500 feet, on Mt. Elgon, on the Aberdare mountains and on Mt. Kenya. It forms a close rosette of slightly fleshy leaves on a short stem, never more than 2 feet from the ground, and a rather slender flower spike up to 6 feet in height. The flowers are pale blue and are visible between the green bracts.

This is definitely a water-loving plant and we manage to grow it quite successfully in a small peat bog at the edge of a concrete tank in Surrey. In winter it has the protection of a glass cloche and has so far been unharmed.

L. elgonensis.—Mt. Elgon, from 11,000 to 13,500 feet, growing chiefly in swampy places. This species forms a very large and closely packed rosette of green somewhat fleshy leaves, only very slightly raised above the ground. At the base of each leaf and generally also in the centre of the rosette is a slightly gelatinous watery mixture. Often a single rosette may be over 2 feet in diameter. This plant forms a stout obelisk-like spike up to 6 feet in height. The flowers are deep blue and can be seen between the stout green bracts which stick horizontally out from the stem. *L. sattimae*, from the Aberdare Mountains, and *L. keniensis*, from Mt. Kenya, are extremely similar in general appearance.

L. Bequaertii (fig. 128).—This species is found in the open Carex swamps from 11,000 to 14,000 feet on Ruwenzori, and belongs to the same series as *L. elgonensis*, to which its appearance is rather similar. The rosette, however, is purplish where that of *L. elgonensis* is rich green. The leaves are almost glabrous and when it is damp the rosettes present a magnificent glistening purple appearance. Both the rosettes and the flower spike are slightly larger than those of *L. elgonensis*, the spike often rising to 8 or 9 feet. The flowers are deep purplish blue, a very rich colour. This is an exceptionally fine plant

and I think one of the most decorative of all the giant Lobelias. In Surrey we have both it and *L. elgonensis*, growing in a small peat bog at the edge of a small pond and they are only protected by a cloche in winter. *L. elgonensis* seems slightly more vigorous and easier of growth than *L. Bequaertii* and several plants of it have also survived the winter in the ordinary sandy garden soil without any cloche protection. Mr. McDOUALL reports from Logan (close to Stranraer) that he does not find *L. Bequaertii* completely hardy, but hopes that *L. elgonensis* may yet succeed.

L. Wollastonii (fig. 129).—This species is found abundantly on Ruwenzori in the heather forest zone and in the more open alpine zone above, from 11,000 up to 14,700 feet. It also occurs on the Virunga Mountains and is, I think, the finest of all the Lobelias when in flower. The flowers are a delicate shade of powder-blue in colour and emerge between the long woolly bracts, which are densely covered with a greyish-blue pubescence, so that the whole spike, often 15 feet in height, is pale silvery-blue in appearance.

Unfortunately this magnificent plant is not at all vigorous in growth in England and does not appear to be nearly so easy of cultivation as some of the other species mentioned. It is just possible that there may be difficulties connected with mycorrhiza. On Ruwenzori it has often been photographed half covered with snow and with icicles hanging from the tips of its leaves, but Mr. McDOUALL reports that it is not hardy at Logan, nor have we managed yet to maintain it out of doors in Surrey. Although it often grows in very damp places on Ruwenzori it is not a plant of the peat bogs as is *L. Bequaertii*, and a plant tried in my little peat bog here soon died.

L. Telekii.—Mt. Elgon, Aberdare Mountains and Mt. Kenya, 11,000 to 14,000 feet. This plant belongs to the same series as *L. Wollastonii*, but its bracts are green rather than grey-blue and as they are very long they largely hide the blue flowers and give the whole spike a shaggy appearance. It produces a close rosette and a fairly stout spike often 5 or 6 feet in height.

This is the only species of giant Lobelia we found which did not seem to grow at all in damp places. It seemed rather to be associated generally with rocky ground, although it also occurred in grassy places. In England it appears to be one of the easiest to grow and to be fairly hardy, having wintered for two years out of doors in Surrey. Mr. McDOUALL reports that it is also hardy at Logan.

ARBORESCENT SENECIOS.

With the Lobelias these form the most striking element in the flora of the higher zones of the equatorial mountains (figs. 130, 131, 133). They are, however, probably less suitable for cultivation in this country, owing to the long gaunt woody stems which most species form, and their growth in England seems much less hardy and vigorous than the Lobelias. Mr. McDOUALL reports from Logan that they are delicate with him when young but appear to get hardy when large.

Originally all the arborescent Senecios on all the mountains were thought to be only variants of a single species, *Senecio Johnstonii*, but now, owing to the work of Mr. A. D. COTTON of Kew and others, a number of separate species have been identified and a zonal series prepared for each mountain ranging from the thin-leaved almost glabrous species, with long ray florets of the heather forest zone, to the dwarfer species with thick leaves covered with silvery pubescence and possessing no ray florets which is characteristic of the highest zones.

The general appearance of the plants will best be seen from the illustration (fig. 133). On the top of a thick woody trunk is a large rosette of vast, somewhat cabbage-like leaves, often more than 2 feet in length. For the sake of its rosette alone these Senecios would be most decorative plants, especially the higher species, where the leaves are covered with a dense white tomentum, giving them a silvery appearance. The flower spikes are usually very large, often three or more feet in height and bearing hundreds of capitula. In flower the lower species, which have long ray florets, are the most handsome. It is not known how old the plants must be before they flower and as far as I know none has as yet been flowered in this country.* On Mt. Elgon most of the species did not flower until they were nearly 5 feet high, and it is unlikely that this represents less than 5 years growth but very probably more.

For horticultural purposes I think that the dwarf *S. Brassica* from Mt. Kenya or *S. brassicaeformis*, a somewhat similar species from the Aberdare mountains, would be the most valuable. These plants do not form long woody trunks and the rosettes are almost sessile on the ground. The leaves are packed closely together and in *S. Brassica* are thickly covered with a close silvery white indumentum. The flowering spike rises to a height of 4 or 5 feet, the ray florets are moderately long and all the stem of the spike and the peduncles are covered with the thick silvery-white hair. For some time we had several plants of this species growing quite vigorously here in Surrey, but unfortunately they have now all died. *S. Brassica*, like most of the arborescent Senecios, is a water-loving plant and is found chiefly in boggy places from 11,000 to 14,500 feet. Another rather dwarf and very attractive species is *S. alticola* from the Virunga mountains, but this does not possess long ray florets like *S. Brassica*.

HELICHRYSUMS (EVERLASTINGS).

There are very many attractive everlastings (fig. 132) on these mountains, several attaining the size of large shrubs up to 5 or 6 feet in height (*Helichrysum Stuhlmanni* of Ruwenzori). If they could be established in this country I am sure that many of them would be considered an improvement on those already cultivated, both from size and colour of flower and from their graceful habit of

* Since this was written Dr. NOEL HUMPHREYS informs me that a Senecio has flowered at Logan from seed collected by him in East Africa.

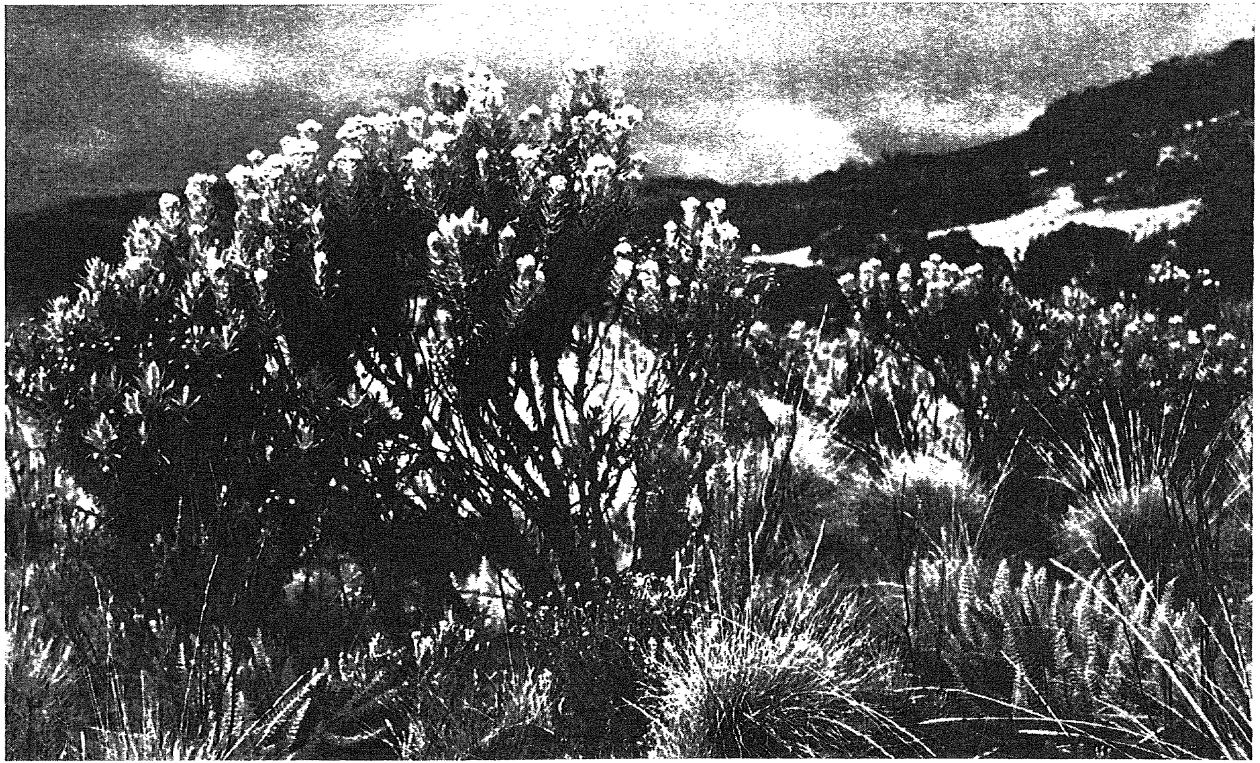


FIG. 132.—A FINE "EVERLASTING" IN KENYA.

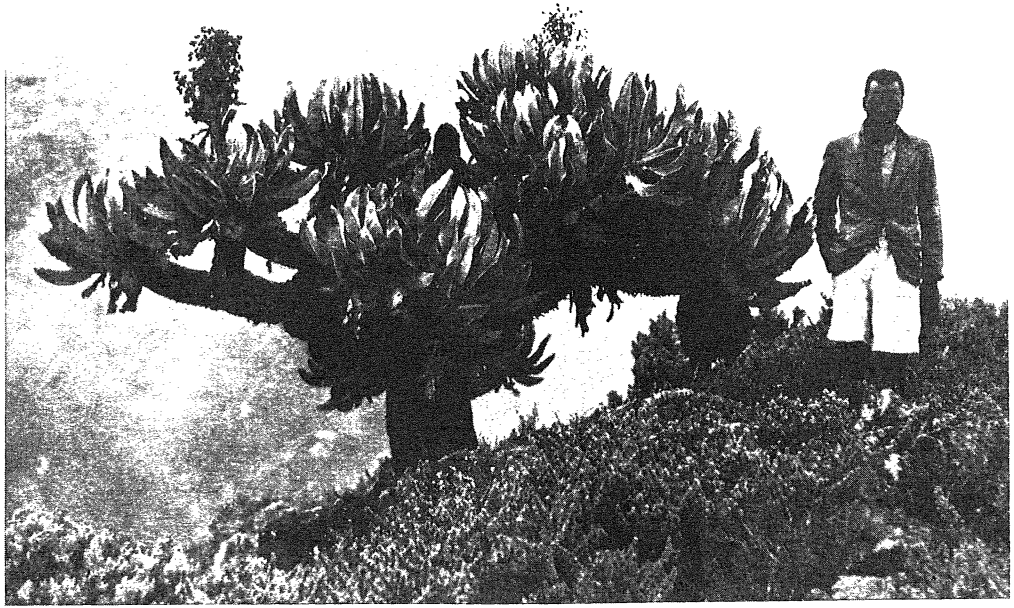


FIG. 133.—SENECIO GARDNERI ON JACKSON'S SUMMIT, MT. EGLON.

[*To face p.* 465.

growth, which is not nearly so stiff as that of many of the cultivated species. Unfortunately they have not so far proved very easy to grow in this country and they are very susceptible to insect attacks and damage. The majority of the species have sticky leaves or long white indumentum covering the stems and leaves and this is inclined to shelter aphids, etc.

One species, *H. Guilelmi*, from the heather forests of Ruwenzori, is most attractive, having shaggy silvery hairs, often several inches in length, surrounding as a web the stem and leaves. The capitula are borne in a large corymb and are a delicate pink in colour. We had this plant in cultivation here, but unfortunately have now lost it. The only species we now have is *H. argyrocotyle*, also from the heather forests of Ruwenzori, a lanky branched plant up to 3 or 4 feet in height with sticky leaves and large corymbs of creamy capitula. On the mountains we did not notice anything peculiar about this plant, but in this country it has developed a strong volatile oil, giving a distinct smell as of ether when anyone brushes against the plant. Although this species must withstand some frost on Ruwenzori, we found that here plants in the open were killed off absolutely at the first frost. The most successful plants* of this species that I have seen raised from our seed are in the Botanic Gardens at Glasnevin, Dublin, where I understand that they are frequently sprayed with a mild insecticide.

Another attractive species is the little *H. Meyeri-Johannis* from the alpine moorlands of Elgon. It has a creeping stem which often runs underground and puts up large pink flowers, cupped in silvery-grey leaves and only rising a few inches from the ground. It seems to be a very variable plant but its dwarf forms would be delightful plants for the rock garden or alpine house. I do not know at present of their cultivation in England. Mr. McDOUALL has raised a certain number of Helichrysums at Logan but he writes that they are not a real success.

IMPATIENS (BALSAMS).

This genus is well represented on these mountains and several of the species are very fine plants indeed. Perhaps the finest of all is the big white *Impatiens elegantissima* from the lower zones of Mt. Elgon. This plant often grows to a height of 6 or 7 feet and produces large white flowers, streaked with deep crimson in the centre and floating on the ends of long petioles like great white butterflies or like the great *Phalaenopsis grandiflora*, one of the finest Orchid species of the Phillipines and East Indies. The flowers are often over 2 inches wide, while the spur may be 3 or 4 inches in length. This species forms underground tubers like the Dahlia and it is possible that in England it might be treated satisfactorily in the same way. In our cool greenhouse in Surrey it has made considerable growth, although it has not flowered. Mr. McDOUALL reports that it is hardy at Logan.

In the evergreen forest and in the bamboo zone of Ruwenzori grows a very fine shell-pink Impatiens with flowers often 1½ to

* They flowered in the summer of 1938.

2 inches across, although not so large as the white *I. elegantissima*. It has the same "butterfly" form of flower with wide wing-like lateral petals. This plant has grown satisfactorily in a cool greenhouse in Surrey and has flowered almost continuously for the past year, even throughout the winter. The flowers are rather variable in size and colour, but the best of them make it, in my opinion, a very fine plant. The stems, which reach a height of 3½ to 4 feet, are deep crimson. Unfortunately it is not hardy, although it seems happy out of doors during the summer in a slightly shady position.

Hypericums (St. John's Wort).

Both dwarf, creeping Hypericums with little flowers and shrubby, almost tree-like Hypericums with large flowers, are found on these mountains. It is the latter which I would like to see introduced into English gardens. In the commonest species, *Hypericum lanceolatum* from Mt. Elgon, the flowers are about the same size as those of the commonly grown *H. calycinum*, the stigma and ovary is a handsome crimson, while the flowers are borne abundantly and the plant grows to the size of a small tree, often 20 or more feet in height. The foliage is evergreen and very similar to that of the commonly cultivated white Veronica. But in my opinion the finest Hypericum of all, the finest Hypericum I have seen anywhere, is *H. Bequaertii* from the heather forests of Ruwenzori. This plant also attains the size of a small tree and bears its flowers pendent at the ends of short branches. Unlike the other members of the genus these do not open flat but are cup-shaped like small tulips hanging from the branches. The outer petals are deep orange. Unfortunately this species has not so far proved very vigorous with us, but it is in cultivation. Dr. Noel Humphreys tells me that he has a plant 5 feet 6 inches high in Cornwall, but that it has not yet flowered.

Kniphofias (Red Hot Pokers).

There are several species of Kniphofia on these mountains and although none of them is as showy as the commonly cultivated hybrids, many of them are attractive plants and well worth cultivation. One of them, *Kniphofia Snowdenii* from Mt. Elgon, is in cultivation in England and is now to be found in a few nurserymen's catalogues. It seems to be generally hardy. The flowers are yellow and are borne in a loose raceme, 2 or 3 feet in height. The plant somewhat resembles a giant Lachenalia.

Canarina Eminii.

The genus Canarina belongs to the order Campanulaceae and only one species, *Canarina campanulata* from the Canary Islands, is at present generally cultivated in this country. *C. Eminii* grows as an epiphyte on Mt. Elgon, between 6,000 and 9,000 feet. The branches and

leaves are glaucous and pendulous. At the ends are large pale orange bell-shaped flowers lined with deep crimson. Inside the bell is a large club-shaped stigma like a clapper. This plant is easily cultivated in a cool greenhouse in this country and forms a permanent fleshy tuberous root. After flowering it quickly dies down and we dry it off like a Dahlia tuber and start it into growth early the next spring. *C. Eminii* has a naturally graceful habit of growth, which combines with the beautiful flowers and the ease of cultivation to make it a valuable plant. During the summer it can be planted outside. It grows easily from seed.

It was exhibited at the Chelsea Show in May 1938 and gained an Award of Merit (see p. 334).

A second species of Canarina from Mt. Elgon has recently been sent to me from the Mt. Elgon Nurseries. It appears quite distinct in growth and flower from *C. Eminii*, the flowers being deep orange outside. They are very attractive although not so large as those of *C. Eminii*.

Choananthus cyrtanthiflorus

(sometimes called *C. Wollastonii*).

Choananthus is a monotypic Amaryllid genus from the bamboo forest zone of Ruwenzori. This fine plant bears scarlet drooping bell-shaped flowers in large clusters around a stem about 18 inches in height. Although still little known here it is in cultivation and a plant received an Award of Merit in 1928 from the Royal Horticultural Society. It is figured in a fine coloured plate in the Botanical Magazine t. 9385, and is reported easy of cultivation under cool greenhouse conditions.

Bulbous Plants.

On Mt. Elgon particularly there are numerous small bulbous species belonging to the genera Crinum, Romulea, Hesperantha, Gladiolus, and Oenostachys, some of which I now have in cultivation in a cool greenhouse in Surrey and which seem desirable. *Crinum Johnstoni* has bulbs the size of a football, long strap-shaped leaves and a fine large flower spike about 3 feet in height and bears several large white flowers, prominently streaked with mauve down the centre of each petal. The brilliant scarlet-flowered form of *Gladiolus Quartinianus*, from the alpine zone of the Aberdares and Mt. Kenya, is also a most attractive plant and very rich in colour. *Oenostachys dichroa* is a curious plant from Elgon. Its corms and habit of growth are similar to those of a Gladiolus. The flowers are small and are shielded by large bracts which are generally a deep mauve in colour. Major F. C. Stern has flowered this plant at Highdown in Sussex but has reported that the bracts were green and showed no trace of mauve coloration. It seems as if this might be a physiological character rather than a purely systematic one.

Epiphytic Orchids are not very plentiful on these mountains and we found none of possible horticultural value. Terrestrial Orchids are common and several are attractive. The finest is perhaps *Disa Stairsii*, which has a fine deep pink spike and is common on all the mountains in boggy places. Unfortunately it is not easy of cultivation in this country.

There are several umbellifers which we thought attractive, in particular *Peucedanum Kerstenii*, an almost arborescent species from the heather forests of Ruwenzori with very fine fern-like foliage, and *Heracleum elgonense* with creamy flowers from the higher zone of Mt. Elgon. Mr. McDouall had *Peucedanum Kerstenii* growing at Logan but reports that it was not a success.

There are no Gentians on these mountains but the large-flowered dwarf white Swertia, which we found on the Aberdares, seemed to me a most attractive plant and I regret that I have not got it growing here. *Delphinium macrocentron*, with its gorgeous electric-blue flowers, is another plant which I would like to be able to grow but I have not, so far, been successful. From Ruwenzori the rampant creeper Thunbergianthus would be desirable for the large cool greenhouse or the orangery, but none of the seeds we collected has germinated and other attempts to introduce it have failed. There is also a large golden-flowered Sedum, about 11,000 feet, on Ruwenzori, which I would like to have been able to introduce. Near the foot of several of the mountains we also found plants such as *Gloriosa superba* and *G. virescens* and *Haemanthus multiflorus*, but these are not elements in the mountain flora and are known in this country.

Although the chief plants of these mountains are by now known, I am sure that there are many which could be profitably introduced into English gardens. There is a possibility also that the second and third generations raised from seed entirely grown in England might prove more hardy and better adapted to English conditions than the first generation.

Thanks are due to Messrs. Lindsay Drummond, publishers, who have allowed me to use freely for this paper material and photographs originally published in my book, Mountains of the Moon, in which a fuller account of these plants will be found.



FIG. 134.—TOMATO SEEDLINGS SHOWING THE EFFECT OF AN ATTACK BY THE GREENHOUSE LEAF-HOPPER.
(p. 481)

[*To face p.* 468.



FIG. 135.—HABRANTHUS ROBUSTUS.

HABRANTHUS ROBUSTUS.

By B. O. MULLIGAN, N.D.H.

THIS plant, whose garden history in England goes back more than a century, has been illustrated in other publications over a long period, but not in our JOURNAL until now. The photograph (fig. 135) shows a group established for several years in the half-hardy house at Wisley, where the bulbs now form a dense clump and flower in profusion every year in August. The flower stems reach a height of twelve or fifteen inches, overtopping the foliage by three inches or more, although the leaves have a natural tendency to droop and the tip is always turned downwards. Each solitary bloom is about three inches long and equally wide across the mouth, the three inner segments being narrower than the three outer, but all of an attractive and delicate pink tint. It has not been tried outside at Wisley, but might be hardy in one of the narrow borders beside the greenhouses. On this point of hardiness as well as cultivation a good deal has been written in the past, and it may be of interest to give a few extracts from various sources.

Writing in his Amaryllidaceae in 1837, where a description of the species was published for the first time, Dean W. HERBERT said: "This plant increases fast by seeds and offsets. The bulbs are killed by frost, if left through the winter in the open ground in England without protection. They will grow freely if kept dry in the winter, and planted out in the spring; but they should preserve their leaves through the winter, and be kept hot and dry in the spring or early summer to promote their flowering, which under that treatment is abundant."

As the Dean wrote from Yorkshire it is quite probable that the winter conditions of that county would not suit a plant which was accustomed to those of South America, since this Habranthus was introduced by Mr. MACKAY of Clapton from Buenos Ayres about 1830 or a little earlier.

In 1831 two coloured plates appeared. In LODDIGES's Botanical Cabinet, vol. XVIII, t. 1761, there are but few details, but in ROBERT SWEET's British Flower Garden, series 2, vol. I, t. 14, the drawing by Dean HERBERT is accompanied by his own information as well as remarks by Mr. SWEET. The latter says: "We have also received a bulb of it from Mr. MACKAY of the Clapton Nursery, which stood the winter well, planted by the side of a wall, in a border, with a southern aspect; it was planted about six inches deep, and a garden pot placed over it in the severe frosty weather, but no other covering. The greatest difficulty we find, is, in keeping it from the slugs, which

are remarkably fond of the foliage of it, as they are also of *Zephyranthes candida*. . . .

" The best situation for it is by the side of a wall, in a southern aspect, as it will not be so liable to be injured by too much moisture, as if grown in a more exposed situation."

Much more recently, in the Botanical Magazine, t. 9126 (1926), the late Dr. STAPF has given a full account of the species, but points out that the place of origin is not known with certainty, since although it was introduced from Buenos Aires and assumed to be a native of the surrounding area, " there is no definite evidence that it has ever been found in Buenos Aires or, in fact, anywhere in the Argentine." He also tells us that the plant has done well for several years in a sheltered bed beside the greenhouses at Kew, and that deep planting in a protected position in light soil is likely to be successful.

There is no difficulty in propagating *Habranthus robustus* as the clumps may be divided in spring when growth begins, or the seeds, which are very freely produced, may be sown as soon as ripe and grown on under cool conditions in a greenhouse or frame.

THE PURPOSE OF EXHIBITIONS AND TRIALS OF NEW VARIETIES IN RELATION TO THE ADVANCEMENT OF HORTICULTURE.*

By F. R. DURHAM, C.B.E., M.C., Secretary, R.H.S.

THE subject of this discourse, the object and purpose of exhibitions and trials of new varieties in relation to the advancement of horticulture, requires no definition. From whatever angle it is looked at an affirmative answer must be expected. It is hardly possible to conceive that the progress in horticulture manifested as it is to-day in its exhibitions and trials has not impressed itself both on the horticulturist and upon all those enjoying the products of gardens in their infinite variety.

In order to appreciate the value of exhibitions and trials it would appear worth while to make a short retrospect of the development of organizations connected with horticulture. While much had been done in early years, perhaps more associated with agriculture (for instance one has only to remember the historic Tulip competitions of the Netherlands so impressingly chronicled by ALEXANDRE DUMAS in his novel " La tulipe noire "), a more general awakening of horticulture, however, would appear to have taken place at the beginning of the nineteenth century by means of the establishment of National Societies. One finds groups of enthusiasts in a great number of countries meeting together, founding National Societies which to-day are the leading and directing bodies of this important science for the benefit of mankind.

BIRTH OF HORTICULTURAL SOCIETIES.

And so it was that, although numerous local Societies existed in the eighteenth century, the Royal Horticultural Society was founded in London in 1804; the Société Royale d'Agriculture et d'Horticulture de Gand (whose famous quinquennial exhibitions are known to all) in 1808; the Verein zur Beförderung des Gartenbaues in den Königlichen Preussischen Staaten, now the Deutsche Gartenbau Gesellschaft, in 1822; the Société Nationale d'Horticulture de France in 1827; the Massachusetts Horticultural Society in 1829; the Oesterreichische Gartenbau Gesellschaft in 1837; the Reale Società Toscana d'Orticultura in 1852, and later in the century the Koninklyke Nederlandsche Maatschappij voor Tuinbouwen en Plantkunde in 1873. All these Societies and many more besides in every country, some general in character, some for the purpose of the cultivation of specific plants, or even varieties of one plant, have been founded with the object in view described in the title of this discourse. It may therefore without doubt be accepted that there was and is a universal endeavour to

* Prepared for and delivered at a plenary meeting of the International Horticultural Congress, Berlin, 1938.

develop Nature's gifts of fruits, flowers and vegetables for the benefit of all. This having been accepted, perhaps the purpose of the Royal Horticultural Society as formulated at its foundation, i.e. " to collect every information respecting the culture and treatment of all plants and trees, as well culinary as ornamental—to foster and encourage every branch of Horticulture and all the arts connected with it," expresses equally well the purpose of every horticultural society be it where it will.

The Royal Horticultural Society, England.

With this short introduction of the whys and wherefores of horticultural societies or associations it is now possible to examine how far such aims and objects have found their achievement, and here the indulgence of the audience is asked if the administration and organization of the Royal Horticultural Society are taken as an example of the object and purpose of exhibitions and trials of new varieties in relation to the advancement of horticultural breeding, in the belief that, although information has been gratefully received from various horticultural authorities in other countries, more can be explained from one specific example than by a cursory attempt at comparative analysis, for when all is said and done the objects are the same and only the machinery is different, adapted to the customs of the peoples in each land. It must, however, be emphasized that what follows is but an outline indicating procedure and not a comprehensive account. It is given merely as an instructive story of the development of horticulture.

Exhibitions and Shows.

The holding of exhibitions by the Society was established in very early days, and, but for certain short periods when the affairs of the Society were not quite in their best state, shows have been held at fortnightly intervals throughout the year, at which, besides plants, fruits and vegetables of general interest, plants, fruits and vegetables new to cultivation and those arising from hybridization were and are exhibited, examined, and adjudicated on. The advantage and even necessity of holding exhibitions at regular intervals are now accepted by all countries with horticultural developments.

Besides those regular shows certain larger exhibitions have been held at fixed periods. The famous Shows in the Temple Gardens of the Inns of Court on the Thames Embankment, commencing in 1889, were a great attraction not only to the home gardener but to many gardeners from abroad. These annual shows continued until 1912, when they culminated in the great International Horticultural Exhibition held in the grounds of the Royal Hospital at Chelsea. The year 1913 saw the birth of the Chelsea Flower Show, the Spring Flower Show of the Society now held annually in the same grounds. This show has become, with all modesty, a red-letter day in the calendar of all horticulturists throughout the world. Every country, too, has its

large exhibitions for the stimulation of interest in horticulture among its inhabitants.

Further, when accommodation can be found, an Autumn Show is now held about the end of September.

This, however, does not by any means complete the tale ; for exhibitions and shows held in Great Britain are not confined to those of the Society. Exhibitions and shows are held throughout the country, some of which are organized by the larger municipalities as Southport, Cheltenham, etc., by the larger horticultural societies like those of Shrewsbury, Glasgow and Edinburgh, and by the county agricultural societies. One may with confidence say without exaggeration that there is scarcely a district, town or village where a horticultural, garden or allotment society, or the like, the greater number of which are affiliated to the Royal Horticultural Society, does not exist. One and all hold shows at which no charge is made for exhibition space and at which the nurserymen stage exhibits and the private growers and amateur gardeners vie with one another in competitive classes.

Specialist Societies and their Relationship to the Royal Horticultural Society.

Then again there are the important kindred or specialist societies dealing with specific plants, Roses, Rhododendrons, Chrysanthemums, Sweet Peas, Carnations, Dahlias, Irises, Delphiniums, Cacti, etc., holding their annual or biannual exhibitions and more than often in the Society's Halls. These kindred societies are not competitors but are collaborators in every sense of the word with the Royal Horticultural Society, for they work in close co-operation with it to achieve the objects defined in the subject of this discourse. This co-operation will be explained more fully later on.

It may be interesting to note that apart from the local London Horticultural Societies, the Halls of this Society are occupied for no fewer than seventy to eighty days in the year, and except during the difficult winter months of the year, a flower show of some character or other can be seen nearly every week in London throughout the year.

It can thus be gathered that as far as Great Britain is concerned, and no doubt from the information received it is true of the developments in all countries interested in horticulture, the intense organization of exhibitions and shows not only offers ample occasions and opportunities to the horticulturist and breeder, whether he be an amateur or a professional grower, to exhibit the results of his work but also must *de facto* have an inestimable importance in bringing knowledge in a practical form to interested persons.

The progress of horticulture, therefore, finds its reflection in the exhibition and show, without which the beneficial work of the breeder would to a great extent be lost.

Before, however, passing to the second phase of the question there is one aspect of exhibitions or shows the importance of which must not be overlooked.

Plant-collecting Expeditions.

The Royal Horticultural Society perhaps more so than its confrères in the rest of the world has from its commencement organized, supported and encouraged plant-collecting expeditions. It is only necessary to mention such names as Douglas (1823), Fortune (1843), Wilson (1899), Forrest (1904) and more recently Kingdon Ward. Arising out of their explorations comes the introduction of new plants to horticulture, and their selection has been one of the most fertile results of exhibitions, without which new plants could scarcely be brought so prominently to the notice of the gardener, much less that of the breeder.

Now to pass to the second part of the subject, the question of trials.

Trials.

It was realized at a very early date in the history of the Society that without trial grounds much would have to be left undone in carrying out its objects, "to foster and encourage every branch of Horticulture," be it the introduction of new plants, fruits, flowers and vegetables, be it the recognition of the best varieties in cultivation, be it the selection of the best of new varieties (the work of the breeder), be it the control of synonomy, etc.

And so it was that as early as 1818 the Society possessed its first trial grounds in Kensington covering 8½ acres; in 1822 new grounds were obtained at Chiswick, 10½ acres of which were retained until 1904, when the present Gardens at Wisley were made over to the Society under a trust deed.

These gardens have gradually been increased in size and have now an extent of 228 acres.

It may be interesting here to digress for a moment. As already hinted the affairs of the Society were not always satisfactory, and owing to financial difficulties a special appeal had to be made in order to retain the gardens at Chiswick. That the work done at these gardens was significant and of great horticultural importance, not only for conducting trials for the sake of the breeder, but also for the guidance of the public at large, cannot be better expressed than by quoting a letter from the press of that period. In the Illustrated London News of April 19, 1856, Herr H. Behrens of Travemunde wrote:

"I have anxiously attended to all that has been published regarding the question of relinquishing the garden of the Horticultural Society. Being a foreigner, and no Fellow of the Society, I am perfectly aware that I am little entitled to meddle with English affairs. Nevertheless, the lively interest I take in everything concerning horticulture, and the thorough conviction that there is no institution in Europe the discontinuation of which would be in a higher degree deplorable for all friends of gardening than the London Horticultural Society, in its full and unabated efficiency, are too strong in me not to give them way, and

make me bold to offer £100 on the same terms as will be fixed for other subscribers of funds to be collected for the conservation of the Chiswick Horticultural Gardens. I know very well that £100 is a trifling sum in England; but I am no man of large pecuniary means; and I think a good will does not fail to find a good place."

It is not the intention to lay undue weight on the trial grounds of the Society as such, or in fact compare its work with that of the trial grounds of Research Stations dealing in horticultural problems at home or abroad, be they stations of Government departments, stations supported by the professional horticulturists with assistance from the Government, stations endowed by the generosity of a private individual or the private experimental grounds of the nurseryman.

It will perhaps be sufficient to say that its methods have been approved by the horticultural world at home and abroad and its certificates sought after as an expression of reasoned and sound opinion.

Organization of Trials.

The organization of trials, however, will be of interest, as it may be in many details unique. It is an organization which has gradually grown up and is closely associated with the general work of the Society and that of the kindred and specialist societies dealing with the cultivation of Dahlias, Sweet Peas, Chrysanthemums, Irises, Rhododendrons, etc. In early days, before the development of horticulture demanded it, the Chiswick Gardens already mentioned were the scene of many selected trials of fruit, flowers and vegetables, i.e. trials which the governing body of the Society decided were desirable to hold. This continued for many years until the Wisley Gardens were established in 1904. Here likewise the system of invited trials was and is continued, and triennial calendars forecast.

Standard Collections of Established Varieties.

Gradually standard collections of plants of general garden use have been established. The value of such a standard collection as the comparative scale to measure new varieties against was first appreciated by the National Dahlia Society when in 1912 a Joint Committee, representing both Societies, calling on the best experts from among the professional growers, professional users and the amateur gardeners, was formed. This has now been followed up and Joint Committees exist almost without exception with all kindred or specialist societies, and their plants are represented at the trial grounds by standard collections, revised and added to after each adjudication.

It must not be overlooked that in addition to these essentially floral committees there is the important Joint Committee for Commercial Fruit Trials, which conducts the trials of new fruits likely to be of marketable value at Wisley, basing its operations on standard collections of varieties.

In the case of vegetables and annual plants control sowings of standard varieties are always made to provide the comparative scale.

The importance of such arrangements for the breeder, amateur or professional cannot be overlooked. He may not see all the varieties that exist, but he has a much better opportunity than otherwise he would have of seeing a collection which shows the development of the plant and the trend in colour, form and habits, and of the public taste.

One word must also be said on the method of cultivation practised on the trial grounds: no effort is made beyond that which good general horticultural practice demands. No attempt is made to produce exhibition or super-magnificent crops, so that those interested in the results may confidently expect the same in their own gardens and not have a false impression of the characteristics of the plants.

In respect of Roses, the National Rose Society possesses its own trial grounds and conducts its trials following the same procedure as described in so far as it is suited to the plant.

The value of the trials is however not only to be measured by the results of growth but also by the results of adjudication, and these are dependent on the conduct of the trials, the constitution of the committees that recommend the awards and the regulations governing them and the trials. The results of adjudication are means by which publicity is attained both in the technical press and in the nurserymen's catalogues. This introduces the third phase of the question.

Committees for Trials.

The Society is governed by a Council, who in turn appoints the Committees. The Committees deal with adjudication whether it be at exhibitions or shows or at the trials. As already indicated, the Committees are drawn from all classes of horticulturists, professional and amateur.

Too much weight cannot be laid on the necessity of the presence of the amateur gardener on Committees. He it is who is perhaps the most important person to encourage as he is the ultimate purchaser, and from his efforts and from his genius vast numbers of hybrid plants have come and are still coming into cultivation. The amateur gardener is bound to play an important part in hybridization of flowers and fruits if not so much of vegetables. The show bench at the exhibition and the trial grounds are his Mecca.

The necessity for the formation of Committees to deal with individual subjects was realized early in the Society's history. The first Committee to be appointed was the Fruit and Vegetable Committee in 1858, to be followed by the Floral Committee in 1859 and the Scientific Committee in 1868. With the development of horticulture the need of special Committees grew. The possibilities of the development of the Daffodil brought the Narcissus and Tulip Committee into being in 1885; the fascination of the Orchid, the Orchid Committee in 1889. The impetus of horticulture was ever increasing, and in 1924 the Floral

Committee was split in two, one dealing with florists' flowers and the second with other ornamental plants not otherwise provided for. Since 1924, other than the Joint Dahlia Committee which commenced operations in 1918, Committees with kindred or specialist societies have been founded.

All these Committees, excepting the Scientific Committee, deal with exhibitions and trials, their object being " to encourage the introduction of new species and the production of improved varieties of fruits, vegetables, flowers and decorative plants by examining and reporting to the Council upon the merits of such as may be submitted ; to report to the Council on fruits, vegetables, flowers and plants grown at Wisley and elsewhere for comparison and experiment ; to recommend awards to novelties or other objects of great excellence which have been hitherto overlooked or ignored ; to collect and disseminate information respecting the adaptability of particular kinds of fruits, vegetables, flowers and plants to varied conditions of soil, locality, etc. ; to refer to the Scientific Committee all objects of special scientific interest which may be brought before them ; and to report to the Council upon non-competitive exhibits staged at the Meetings and to recommend awards for exhibits of outstanding merit."

Each Committee has its own regulations suited to the subject it deals with and generally includes some or all of the following definitions of qualifications for adjudication : hardiness and habit, for general garden use, for the herbaceous border, for bedding ; suitability for exhibition, for cutting, for market, as an ornamental pot plant, etc. ; fruit and vegetables being likewise dealt with in accordance with their individual characteristics.

As a rule, all plants for exhibition purposes and for purposes not calling for trials, requiring as they do cultivation of a different character from that of the garden, are adjudicated on at the Shows and Exhibitions ; when for other uses—bedding, decorative, garden use, etc.—the plants are the subject of selection by the Committee and adjudicated on after trial.

Awards.

The Awards made by the Society in order of their significance are First Class Certificate, Award of Merit and Preliminary Commendation, the last being of importance as a recognition of value subject to further examination or trial. After trial two other lower awards besides the Award of Merit and First Class Certificate may be given—" Commended " and " Highly Commended." All these awards are made to the objects and not the person, and in the case of annual plants and the like to the strain and not to the individual plant.

It is, of course, impossible to go into the full details of these regulations, but it is thought that these few words will appeal to the imagination as to the care exercised in their conduct.

Such a system as this, from the information collected, obtains in other countries, and each country has its code of awards suited to its

climatic requirements and its public taste. Connected closely with trials is the work of synonymy and of the control of the naming of varieties, an essential factor vitally important to the breeder. As far as Great Britain is concerned, the recommendations of the Ninth International Horticultural Congress, held in London, have been carried out by the Royal Horticultural Society and its co-operation with the kindred or specialist societies, namely " that a properly organized trial must, among other things, provide full opportunity for comparing new varieties with old, growing under the same conditions, must give all varieties the same opportunity of showing their characteristics and must be judged by competent experts in the plant and in trials."

From what has now been briefly described it may justly be said that should the plant breeder take the opportunity afforded him in visiting and examining the exhibitions, shows and the trials at the gardens and submitting his produce to the governing committees, he is sure not only to find an appreciation of his own work but also inspiration for his future ideas.

How far this is true, a few instances of the development of plants since the commencement of recognized horticultural societies may add interest to and confirmation of the facts and system already described.

Examples.

From the records of the Society the following facts of the working of trials and adjudications of Committees may be gathered. Take the Dahlia, a plant which has been popular over a very long period :

1859.	10	Awards.	
1860–69.	155	,,	
1870–79.	118	,,	In 1879 Dahlia Juarezii was introduced, which was the parent of the Cactus Dahlia.
1880–89.	124	,,	
1890–99.	220	,,	The influence of the breeder and the Cactus Dahlia.
1900–09.	209	,,	
1910–19.	258	,,	The Joint Committee was formed in 1918.
1920–29.	158	,,	The standard collection and annual trials at the Wisley Gardens instituted in 1920.
1930–34.	92	,,	

Trials were held periodically throughout this period until 1920, when the standard collection was planted and annual trials of selected plants were instituted. Two plants which earned awards in early days are still in cultivation : ' James Cocker,' 1870, and ' John Bennett,' 1875.

The breeder of Dahlias has evidently made use of his opportunities and fashion still holds the plant dear ; but not so with the next garden friend—the Pelargonium. First trials were held at the Chiswick

Gardens in 1860–61, and following the ten-year periods show the decline of popularity :

1860–69.	364 Awards.	1900–09.	9 Awards.
1870–79.	273 ,,	1910–19.	6 ,,
1880–89.	75 ,,	1920–29.	4 ,,
1890–99.	22 ,,		

Since the last date 9 Awards have been given.

The breeder, the exhibition lover and the gardener of the somewhat formal and stiff period of bedding gardening indeed had a good run : the herbaceous border and the shrubbery have forced the breeder away, but fashions change and perhaps the Pelargonium will come back, the breeder by chance obtaining a new break in this plant of accommodating habits, long flowering and gorgeous in colour, and requiring little attention during its season.

Taking shrubs, there is one which used to be very popular, but lost its popularity, being considered tender and requiring shelter—the Camellia. Now since its habits and its hardiness are better recognized the breeder can set to work again with courage.

1862–69.	12 Awards.	1900–09.	2 Awards.
1870–79.	3 ,,	1910–19.	1 ,,
1880–89.	1 ,,	1920–29.	3 ,,
1890–99.	6 ,,	1930–35.	5 ,,

Another popular flower, the Daffodil. The progress and development of this flower can be assumed when it is realized that the Society's register contains no fewer than 6,000 names. The records of the Society give the following results. Prior to 1885, when the Narcissus Committee was instituted, it will be found that 11 Awards were given.

The progress of the breeder is shown in the following figures (here the amateur gardener has performed almost all of the work) :

1885–94.	20 Awards.	1915–24.	115 Awards.
1895–04.	129 ,,	1925–34.	182 ,,
1905–14.	69 ,,		

Regular annual Daffodil shows were instituted in 1923, prior to which date they were occasional. Here again is evidence of the influence of shows, trials and committees and of the work of the breeder.

Now take another popular garden plant, the Sweet Pea :

1880–99.	30 Awards.	1900–19.	74 Awards.

The 'Spencer' form appeared in 1902, and a number of trials were held at the Gardens :

1920–34. 98 Awards.

Regular annual trials with Joint Committee adjudicators commenced in 1931 ; 6 other trials were held prior to this date and during the 15 years. Again the usefulness is obvious.

The importance of shows in relation to the introduction of new plants has been mentioned and here a few statistics are of interest as the breeder asserts himself.

Primula malacoides.—This is perhaps the most modern example and one still in its infancy. It was introduced by GEORGE FORREST just thirty years ago, and Messrs. BEES obtained an Award of Merit in 1908. The first white sport was exhibited in 1912, and in the period 1908 to 1935 no fewer than 16 Awards have been given to the breeders' efforts. New varieties are being submitted yearly and referred for trial before adjudication.

Although in the main only flowers have been dealt with, similar statistics could be with equal ease produced showing that the development of fruits and vegetables has closely followed the same lines.

And now with these concluding figures, which are submitted to be the answer to the proposition set out in the title of this discourse, there cannot be any doubt of the object and purpose of exhibitions and trials of new varieties in relation to the advancement of horticultural breeding, and ever true are the words on gardening of the great philosopher, FRANCIS BACON : " and indeed it is the purest of human pleasures. It is the greatest refreshment to the spirits of man ; without which buildings and palaces are but gross handy works."

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

LXXXV.—THE GLASSHOUSE LEAF-HOPPER, *ERYTHRONEURA PALLIDIFRONS* EDW.

By G. FOX WILSON, N.D.H., F.R.E.S., F.L.S., Entomologist.

THE Glasshouse Leaf-hopper, *Erythroneura* (*Zygina*) *pallidifrons* Edw., has become of increasing importance as a pest of glasshouse plants during recent years. It is considered desirable, therefore, to give an account of the insect, its food plants and life history, and to outline the measures to be adopted for controlling infestations under glasshouse conditions.

Mr. J. C. F. FRYER, M.A., Director of the Plant Pathological Laboratory of the Ministry of Agriculture, has kindly informed me that the first record of this Leaf-hopper as a pest on Tomatos, Tobacco and other plants was made near Manchester in 1918.* Specimens of the insect were submitted to E. A. BUTLER, who stated (December 1918) that the species concerned was *Zygina parvula* Boh. Mr. FRYER further states in his letter (October 13, 1937) that on the basis of this determination specimens sent by HARPER GRAY † in 1919 from a nursery at Newcastle were identified as *Z. parvula*. Records of this pest in the Ministry of Agriculture's Summary of Plant Pests from 1919 to 1932 refer to this insect as *Erythroneura* (*Z.*) *parvula*, and a note in the April 1932 Summary states that all previous records of *E.* (*Z.*) *parvula* are referable to *E. pallidifrons*. *E. pallidifrons* was not distinguished as a separate species until 1924,‡ hence the previous misnomer in the earlier records.

Miss ELSIE MACGILL § was the first to draw attention to the error in the determination of this injurious species, for the supposition had been that the majority of Leaf-hopper records under glass were referable to two species, namely *E.* (*Z.*) *parvula* Boh. and *E. pallidifrons* Edw. Miss MACGILL collected material from several widely separated localities, but only *E. pallidifrons* was obtained, and the probability is that most if not all the damage attributed to *E. parvula* is really caused by *E. pallidifrons*. Mr. W. E. CHINA (British Museum, Natural History) has stated that there is no authentic British male specimen of *E. parvula* on record, and his opinion is also that past records of the infestation of glasshouses by this insect are probably due to mistaken identity.

Some notes on this Leaf-hopper as a glasshouse pest were put on

* Board of Agriculture and Fisheries, Misc. Publications No. 23, 1920, p. 35.
† Board of Agriculture's Summary of Plant Pests for May 1919, p. 11.
‡ EDWARDS, J., Entomologist's Monthly Magazine, 1924, vol. lx, pp. 52–58.
§ Bull. Entom. Research, 1932, vol. xxiii, pp. 33–43.

record by Dr. G. H. RODMAN in 1928,* in view of the economic importance of this insect to glasshouse owners.

E. pallidifrons has been recorded as a glasshouse pest from nearly every county in England, from several Welsh localities, and from the Channel and Scilly Islands.

Description.—The adult was described by EDWARDS in 1924 (*loc. cit.*), while the five nymphal stages or instars have been described in detail and figured by Miss MACGILL (*loc. cit.*).

The *adult* hopper (fig. 136A) is a pale yellow, slender, delicate insect just over ⅛-inch (3·5–4 mm.) in length. When at rest its yellowish iridescent wings extend beyond the tip of the body, and the dark areas form two V-shaped bands across the back of the insect. The head is pale yellow with dark prominent eyes, and there are two small distinct spots on the face between the eyes. The thorax is dusky, and there are two distinct dark spots between the bases of the fore-wings. The legs are slender, yellowish and long.

The *egg* is elongated, slightly curved, white and devoid of distinctive markings, the length being from 0·5–0·7 mm.

The *nymphs* are small, white and, at first, almost transparent creatures (fig. 136B). There are five instars, and wing-pads appear during the third stage and increase in size during the fourth and fifth (fig. 136C) stages.

Life History.—The female hopper possesses a saw-like ovipositor by the aid of which the eggs are inserted into the veins on the underside of the leaves. The secondary veins are generally chosen for oviposition, and the eggs as a rule are laid singly, though sometimes they are deposited in groups of three to eight in the same vein (MACGILL, *loc. cit.*). The egg is not readily distinguishable at first within the vein, but later the minute swelling is discernible with the naked eye. The incubation period varies with the season and temperature, and extends from about a week in midsummer to over five weeks in January.

The nymphs on hatching are somewhat inactive, and are delicate, creamish-white, almost transparent creatures. The insect passes through five nymphal stages and becomes extremely active as development takes place. They feed chiefly on the underside of the leaves and move from leaf to leaf with ease. The moult-skins are conspicuous objects on the underside of infested leaves, and are responsible for the term "Ghost Fly" or "Ghost Insect" which has been given to the pest by some growers. These moult-skins persist on the leaves for some considerable time owing to the anchoring of the head by the stylets during the process of moulting (fig. 136D).

The nymphal period also varies according to the season and temperature, and ranges from about three weeks to seven weeks (MACGILL, *loc. cit.*).

The adult hoppers are extremely active insects, more especially in sunny weather, and they leap and fly into the air when the plant on

* Entomologist's Monthly Magazine, 1928, vol. lxiv, pp. 201–203.

which they are resting is disturbed. They rest with the wings closely applied to the sides of the body—the wings extending beyond the tip of the abdomen (fig. 136A).

Breeding is continuous under glasshouse conditions, and all stages occur at the same time owing to the overlapping of the generations.

It was noted by HODSON * in the Scilly Islands that the hoppers overwintered on Dog's Mercury (*Mercurialis perennis*), which was growing as a weed in a Tomato house. The writer has frequently observed the overwintering of the pest on Chickweed (*Stellaria media*) in empty plant houses.

Method of Feeding.—The feeding habits of this hopper have been fully described by MACGILL (*loc. cit.*). The nymphs and adults feed on the leaves and never appear to attack the stem or shoots. They prefer to feed on the underside of the leaf, and the stylets are generally pushed right through to the palisade tissue, so that the injury is first apparent on the upper surface of the leaf. The cell walls are pierced, and the cell contents sucked out so that a bleached area appears and persists. The first signs of attack are a number of round white spots where the chlorophyll has been abstracted (fig. 137, b). As feeding continues, the spots become confluent and bleached areas are formed (fig. 137, a, c, d). The leaves become markedly variegated and, in severe infestations, completely white (fig. 138).

Host Plants.—The Glasshouse Leaf-hopper has a wide range of food plants, and is especially injurious to forced Mint (SPEYER †), various Primulas, and Tomato (fig. 134). The infestation may be so severe in the case of Tomato seedlings that the plants become stunted and never recover from an early attack.

A list of the chief host plants is given in Table I, and includes thirty cultivated plants and three weed hosts.

Natural Enemy.—Only one parasite has been recorded, namely a minute Hymenopterous (Mymarid) " wasp," *Anagrus atomus* (L.) Hal., which lays its eggs within the eggs of the hopper. This parasite has so far proved unsatisfactory in controlling infestations (MILES ‡).

Control Measures.—The Glasshouse Leaf-hopper has proved a difficult pest to control owing to its tolerance of insecticidal washes and fumigants, and its eradication in heavily infested houses is a somewhat difficult and lengthy matter.

The fact that some weeds, more especially Chickweed, are favoured food plants of the hopper, makes it desirable to destroy all weeds both in glasshouses and in the immediate surroundings to prevent the survival of the pest during the dormant season. This is of special importance in commercial houses, which are left empty for a period following crops of Tomatos and Cucumbers.

An infestation may frequently be checked by removing the lower infested leaves of plants and by crushing the larvæ and adults on the upper leaves. The activity of the adult hoppers during bright weather

* Seale-Hayne Agric. Coll., Newton Abbot, 2nd Ann. Rept., 1925, No. 19, p. 5.
† Experimental and Research Station, Cheshunt, 13th Ann. Rept., 1927, p. 80.
‡ Insect Pests of Glasshouse Plants, 1935, p. 77.

makes it necessary to carry out the operation on dull days or in the early morning when they are sluggish.

TABLE I.

*Chief Host Plants of Erythroneura pallidifrons, showing degree of Infestation.**

1. *Cultivated Plants.*			
Ageratum	+ +	Pelargonium, Cape	+
Asparagus Sprengeri	+	,, Ivy-leaved	+
Auricula	+	,, Zonal	
Beans, Dwarf French	+ +	(Geranium)	+ + +
Calceolaria	+ + +	Petunia	+
Chrysanthemum	+ +	Polyanthus	+ +
Cucumber	+	*Primula Forrestii*	+ + +
Dahlia	+	*P. kewensis*	+ + +
Fuchsia	+ +	*P. malacoides*	+ + +
Gossypium	+	*P. sinensis*	+ + +
Heliotrope	+ +	Rose	+
Lettuce	+ +	Salpiglossis	+
Mimulus	+	Salvia	+ + +
Mint	+ + +	Tomato	+ + +
Nepeta	+ +	Verbena	+ +
Nicotiana	+ +		
2. *Weeds.*			
Chickweed, *Stellaria media*			+ + +
Dog's Mercury, *Mercurialis perennis*			+ +
Enchanter's Nightshade, *Circaea lutetiana*			+

Spraying operations against this pest are only partially successful in controlling an infestation owing to the tolerance of the nymphs and adults to liquid sprays and to the difficulty of reaching the underside of the leaves of pot plants, more especially Primulas. The application of a Nicotine-soap wash (Nicotine, 95–98 per cent., ¾ fluid ounce; Potash (Horticultural) Soft Soap, ¾ lb.; Water, 10 gallons) to infested plants will result in some considerable control of the pest provided the wash is directed to the underside of the leaves and the insects are thoroughly wetted by the spray. Two or three applications of the wash at intervals of about ten days are desirable. It is possible to immerse the foliage of small pot plants in this wash so that thorough wetting of the leaves is attained.

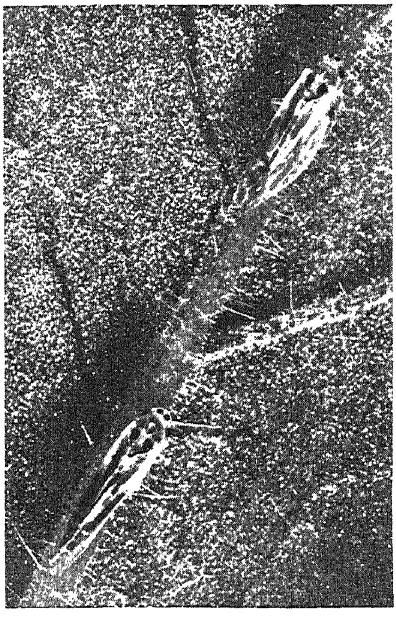
Washes containing Derris, Pyrethrum extract or Eucalyptus oil are far less satisfactory than Nicotine-soap against this pest.

The most satisfactory control of the hopper is obtained with a Nicotine dust, but its use on some plants is disliked owing to the fact that the dust remains on the foliage for some time and is considered unsightly. The penetrative power of the dust is such that the hoppers on the underside of the leaves and in the centre of large plants are destroyed.

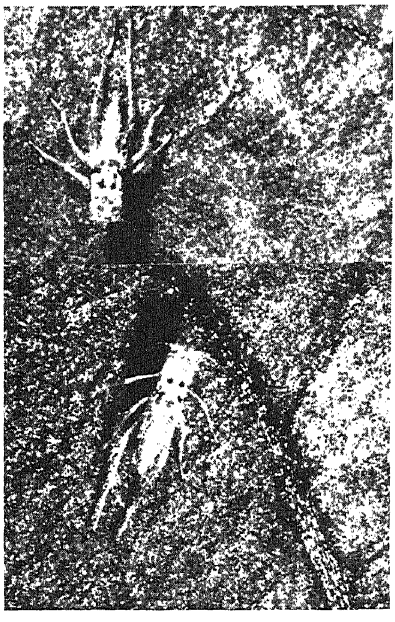
Fumigation with Nicotine vapour or with Hydrocyanic acid gas at a concentration suitable for use in a house of mixed plants gives only a slight control of the pest. It has been found that even regular fumigation with either Nicotine or Hydrocyanic acid gas will not effectually check the ravages of the Glasshouse Leaf-hopper.

My thanks are due to my colleague, Mr. F. C. BROWN, for the photographs illustrating this article.

* Very severe + + +. Severe + +. Fairly severe +.



A



D



B



C

FIG. 136.—THE GREENHOUSE LEAF-HOPPER, ERYTHRONEURA PALLIDIFRONS

A, Adult (× 6). B, 2nd, 3rd and 4th nymphal stages (× 3).
C, 5th nymphal stage (× 7). D, Moult-skins (× 6).

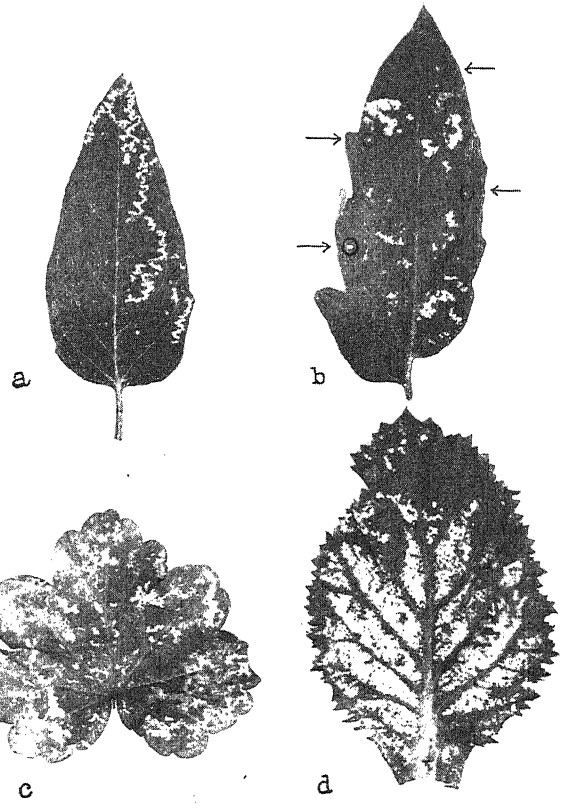


FIG. 137.—LEAVES ATTACKED BY THE GLASSHOUSE LEAF-HOPPER.
a, Solanum jasminoides. b, Tomato. c, Pelargonium. d, Primula.

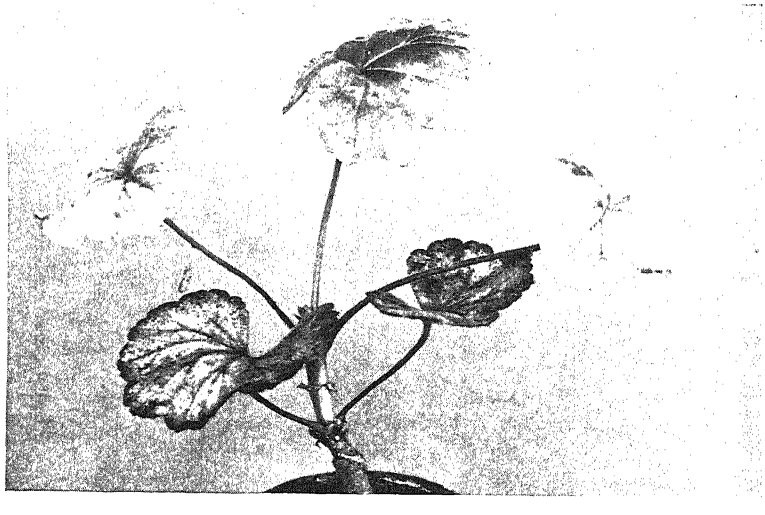


FIG. 138.—PELARGONIUM ATTACKED BY THE GLASSHOUSE LEAF-HOPPER.

[*To face p.* 485.

PRIMULA CLARKEI WATT,

By FRED STOKER, V.-P.L.S., V.M.H.

THE original description of this species (Jour. Linn. Soc. vol. 20) runs "*. . . glaberrima, foliis* 1–1½ *pollicaribus orbiculari- v. elliptico-cordatis dentatis v. crenatis apice rotundatis, scapo* 0, *pedicellis petiolos saepe aequantibus, calyce late campanulato, lobis brevibus, corollae tubo gracili, ore exannulato, limbo plano, lobis* 2-*fidis, capsula globosa inclusa.*"

This, in the publication referred to, is followed by the supplementary note, "A very singular species, with the habit of *Viola palustris*. *Rootstock* slender, woody. *Leaves* membranous, nerves very slender; petiole 2–4 inches, very slender, base narrowly sheathing. *Pedicels* 2–3, very slender. *Corolla-tube* ⅛ inch, lobes narrow. *Ovary* globose, acute; stigma capitate. *Seeds* sub-globose, black, minutely papillose, $\frac{1}{40}$ inch diam." (fig. 139).

The uncompromising "*scapo* 0" and "*petiole . . . very slender*" are not quite in accordance with the morphology of what we are accustomed to regard as *Primula Clarkei*, and this note attempts to smooth out the discrepancies existing between, so to speak, the plant on paper and the plant itself. Moreover, as the published description is a meagre one, this opportunity is taken to amplify it.

The *rootstock* is as described above. The smooth *leaves*, thin in texture, issue singly from the rootstock; that is to say, they are not arranged in rosettes. The *petiole* is pale green, pink-streaked, shallowly channelled, slightly sheathing, narrows from below upwards and, at flowering time, is from 2·5 to 3·5 cm. long and from 1 to 2 mm. broad in the middle of its length. The blade may be one of many shapes; rounded, cordate, somewhat reniform, almost truncate or broadly ovate (figs. 139 and 140) and its edge dentate, serrate or crenate. At flowering time it is from 1·2 cm. to 1·7 cm. long and 1 to 2 cm. broad. The *flowers* are *generally* carried singly on pedicels 3·75–5·5 cm. in length and 1 mm. in diameter arising directly from the rootstock (hence "*scapo* 0"), but may be arranged in a whorl of 2–5 at the end of a peduncle. In this, a scapose inflorescence, the flowers are often malformed (both under- and over-developed blooms occurring in the same head), crowded and almost sessile, but normally are of perfect shape and carried on relatively long pedicels (fig. 141).

The *calyx* is tubular, 7 mm. long and 3–4 mm. across at its free edge. Its lobes are lanceolate-acuminate, free in their distal halves, punctate-glandular within but externally smooth and pink-streaked green in colour.

The rose-pink limb of the *corolla* is from 1·2 to 1·8 cm. wide. Its tube is yellow, rugose inside and out, 8 mm. long and 2·5 mm. in diameter at its middle. The spread portion of the petal is flat, free, obovate, smooth and 2-lobed.

The *stamens* are situated deeply in the corolla-tube. The *filaments* are epipetalous, 0·3–0·4 mm. long, and the *anthers*, 1·5 mm. in length, are pale yellow and contain creamy-white *pollen*.

The *pistil* presents (1) a clavate stigma, longitudinally grooved on one side, 1 mm. in length and width; (2) a very slender style, 7 mm. long; and (3) a globose, slightly compressed ovary, 1·75 mm. in length and diameter.

The *capsule*, minutely papillose and globose-oblong, is 4·25–4·50 mm. long and 3·75 mm. in diameter.

Now to return to what appears to be a lack of conformity between the original descriptions and the living plant. We have already seen that it may bear two distinct types of inflorescence, and, as for the "very slender" petioles, one surmises that the author of those words described the leaf-stalks from dried specimens, such as are shown in fig. 139. Even half-drying causes the petioles to shrink to less than half their original width (fig. 140) and, moreover, encourages them to twist on their axes and thus give the impression of further attenuation.

P. Clarkei is apparently endemic to Kashmir and, according to C. B. Clarke, in whose honour it was named, inhabits Poosiana at an altitude of 7,000 feet.

It is perfectly hardy in Essex, and indeed grows with a luxuriance in open ground never approached by pot-grown plants (fig. 142). Its apparent difficulty in setting seed when under cultivation is compensated for by its facility in vegetative increase.

To the best of my belief, it was due to the enterprise of Mr. T. HAY that *P. Clarkei* reached this country, and certainly to his generosity that we owe its distribution.

A RUST DISEASE OF RHODODENDRON, UNCOMMON IN GREAT BRITAIN.

By DOROTHY ASHWORTH, Ph.D., Wisley.

IN July 1937 a few young shoots of *Rhododendron Roylei* were received at Wisley for examination. Most of the foliage looked healthy and was of the season's growth, but amongst these good green leaves there were a few showing brownish-yellow irregular areas on the upper surface. These were not large, rarely reaching more than a quarter of an inch in diameter. On turning the leaves over, a few powdery yellow pustules were seen on the discoloured areas. This proved to be the rust fungus, *Chrysomyxa Rhododendri*, a fungus quite common on the Continent but only recorded twice on Rhododendron in Great Britain. In view of the rarity of its occurrence the following notes may be of interest.

Under the microscope the yellow powder was seen to consist of a mass of uredospores, usually termed the summer spores of a rust fungus. When ripe the spores were slightly ellipsoidal, yellow, and measured 17–28 by 15–22 μ. The walls were irregularly thickened to give a warted appearance.

The fungus threads (mycelium) are distributed through the leaf tissue and fill the spaces between the cells. As a result of this invasion the tissue of the leaf dies and loses its healthy green colour, causing the discoloured areas seen on the upper surface. When the leaf tissue has been invaded in this way, the fungus begins to produce fruiting bodies, the uredospores. First the mycelium collects in a mass towards the lower surface of the leaf, and from this mass regular chains of cells are formed lying side by side. The walls of the cells composing these chains are very thin at first, but gradually become thicker, and at maturity the chain breaks up and the spores are set free. Until the first uredospores are ripe the pustule is covered by the lower epidermis and appears as a light green blister on the under surface of the leaf. As the fungus mass inside the leaf increases in size tension is produced, causing the outer tissues to break and the spores are liberated. This was the only spore stage found on the specimen examined, but two further stages are required to complete the life cycle of the rust.

Under suitable conditions of moisture and temperature the spores germinate by sending out a thin tube which enters the Rhododendron leaf by way of the breathing pores or stomata, and the whole process of the formation of uredospores is repeated.

Later in the season instead of forming uredospores the fungus forms a second type of spore, the teleutospore. As the writer has not had the opportunity of examining pustules of these spores they will not be described in detail. It is known that the teleutospores germinate

as soon as they are ripe, but they are incapable of reinfecting the Rhododendron and cannot perpetuate the rust unless they alight on the needles of the spruce, *Picea Abies*. Here a third kind of spore is formed, the aecidiospore, which in its turn is unable to reinfect the spruce but must return to the Rhododendron. In this way the life cycle of the rust *Chrysomyxa Rhododendri* is completed.

On the Continent the disease is of common occurrence and is serious in Switzerland and the French Pyrenees, where the spruce and Rhododendron occur commonly together. In some years the attack reaches epidemic proportions, causing considerable damage to the spruce, on which it may bring about complete defoliation.

Co-operation with the Plant Pathological Laboratory of the Ministry of Agriculture has established this as the third published record of the occurrence of this rust in Great Britain as the uredospore stage on Rhododendron. The first record seems to be that of D. A. BOYD, who found the fungus in the uredo- and teleuto-spore stage in 1913 at Douglas Castle, Lanarkshire. In September of the same year M. WILSON found the aecidiospore stage of the rust in the Solway area on spruce, and in 1916 J. W. TRAIL reported the same stage from Aberdeenshire. The second record of the uredospore stage came from Styal, Cheshire, where HOLMES SMITH found the rust on Rhododendron in 1930. The present material was received from Penzance, Cornwall, and its occurrence on *R. Roylei* is a new host record. From Europe and elsewhere there are records of this rust on the following species of Rhododendron: *R. ferrugineum, R. hirsutum, R. intermedium, R. dauricum, R. Kotschyi, R. myrtifolium, R. Kaempferi.*

The conclusion that the disease is not serious in Great Britain is borne out by the few records made over the past quarter of the century. Should it become troublesome on Rhododendrons growing in the vicinity of spruce, it would be advisable to pick off and burn the affected leaves and spray the plants with Bordeaux mixture to which a good spreader has been added.

THE GREY SQUIRREL: THE PROS AND CONS OF THE QUESTION.

By L. SWAINSON.

MANY gardeners are, like the present writer, as interested in the birds in their gardens as they are in their plants, and for this reason are no doubt exercised in their minds when visited by the grey squirrel, the antics of which little animal are undoubtedly most attractive. It was the attitude of the grey squirrel towards birds which led me to inaugurate the campaign against the grey squirrel, and though one is naturally loth to advocate the destruction of any animal, if it is a question of a powerful rodent against a defenceless bird, one is bound to come down on the side of the latter; for although no doubt some birds are a nuisance in one's garden, a great deal can be done by means of black cotton, netting, etc., to protect one's crops, whereas nothing can be done to save the birds from the attacks of the grey squirrel.

I am not one of those who maintain that all grey squirrels are inveterate bird eaters, for I think it is established that in those gardens where the squirrels are fed they do not molest the birds. It is now, however, illegal to feed grey squirrels, and in any case as about 20,000 square miles of the country are infested by them, it is obvious that when their more natural food becomes scarce after a hard winter they will take toll of the birds. Nor do I subscribe to the theory that the grey squirrel is entirely responsible for the reduction in the numbers of our own little red squirrel, for the latter has decreased considerably in areas where there are as yet no greys; and in seven years' close contact with the problem I have received only two reports of authenticated cases in which a grey squirrel has been seen to attack a red one.

Nor, again, do grey squirrels breed like rabbits, as many people maintain. Mr. A. D. MIDDLETON, who was for some time with the University Museum of Oxford, and who probably knows as much about the habits of this animal as anyone, writes in his book * that they rarely breed more than once a year, and rarely have more than four in a litter. No doubt so much is known of the grey squirrel's destructiveness that it is quite unnecessary to exaggerate his rate of breeding. Since the inception of the National Anti-Grey Squirrel Campaign I have received hundreds of letters from all over the infested areas, which provide all the proof any unbiased mind could require

* The Grey Squirrel, by A. D. MIDDLETON. Sidgwick & Jackson.

[NOTE.—A leaflet (Advisory Leaflet No. 58, price 1*d.*) dealing with this pest has been published by the Ministry of Agriculture and Fisheries. It can be had through any bookseller. The Grey Squirrel has been made the subject of an Order under Section 10 of the Destructive Imported Animals Act, 1932.]

of the damage these rodents do. The late Mr. MEADE-WALDO, well known as one of the greatest authorities on birds, described the grey squirrel as the most dangerous introduction we have ever had. He said that it rendered fruit-growing impossible, and destroyed both nests and nesting-boxes. Mr. OLIVER G. PIKE, the well-known author and naturalist, told me the other day that the destruction done by the grey squirrel in woods usually frequented by nightingales and warblers was simply appalling. "I wonder," he added, "how the birds manage to carry on at all." Surely this evidence is sufficient, quite apart from what one's own experience may be.

It is of course a thousand pities that this North-American rodent was ever liberated in British woods, but it is no good crying over spilt milk, and the mistake having been made it is up to us to rectify it as far as possible. Unfortunately, however, there is nothing one can do but shoot and trap, both of which are extremely distasteful to many people, including the writer. But if only every landowner or tenant would do his bit, it would be possible to exterminate an animal which has no redeeming feature, if one excepts its natural agility. That the country as a whole is now alive to the situation is proved, I think, by the fact that after Mr. C. H. MIDDLETON'S recent broadcast advocating the hardening of one's heart and the humane destruction of all grey squirrels, he received only one or two letters in protest, and they, illogically enough, were from people who appeared to be fond of animals but who would rather condemn to death thousands of British birds per annum than exterminate one of their greatest enemies.

PLANTS TO WHICH AWARDS HAVE BEEN MADE.

Chrysanthemum (Early Flowering) 'Jim Tomlinson.' A.M. August 30, 1938, as an exhibition variety. Shown by Mr. H. Woolman, Shirley, Birmingham. Stems stout and stiff, 15 to 18 inches long. Flowers 4 inches across, rich scarlet terra-cotta ; petals broad, of good substance, inner incurved, outer horizontal, reverse old gold.

Dendrobium × 'Roi Albert.' A.M. August 9, 1938. This is the result of crossing *D. D'Albertisii* with *D.* × 'Antelope.' The flowers are whitish, and have petals which are erect and twisted, white at the base and greenish at the tips, while the labellum is prettily marked with carmine venation. The spike bore five flowers. Exhibited by Messrs. Sanders, St. Albans.

***Gladiolus 'Anna May Wong.' H.C.** July 22, 1938. From Messrs. Wakeley, London. 4 feet, branched, with sixteen to eighteen flowers, four or five out at a time ; flowers 4½ inches diameter, soft pale creamy-yellow self with deeper colour in the throat. Large-flowered type.

***Gladiolus 'Anthony Eden.' A.M.** July 22, 1938. From Messrs. Wakeley. 4½ feet, branched, with fourteen to sixteen flowers, six or seven out at a time ; flowers 5 inches diameter, white with occasional rose spots. Large-flowered type. Raised by Messrs. W. Pfitzer.

***Gladiolus 'Gala Queen.' H.C.** July 22, 1938. Raised and sent by Messrs. Unwin, Histon. 4 feet, branched, with fourteen to sixteen flowers, three or four out at a time ; flowers 3½ inches diameter, bright scarlet-cerise with middle of lower petals bright yellow ; throat yellow. Primulinus type. Flowering from July 15.

***Gladiolus 'Johann Sebastian Bach.' H.C.** July 22, 1938. From Messrs. W. Pfitzer, Stuttgart, Germany, and Messrs. Wakeley, London. 5 feet, branched, with eighteen to twenty flowers, four or five out at a time ; flowers 5½ inches diameter, bright rosy-red with a central white line on each petal. Large-flowered type. Raised by Messrs. W. Pfitzer.

***Gladiolus 'La Paloma.' H.C.** July 22, 1938. From Major G. M. Churcher, Lindfield. 4 feet, unbranched, with eighteen to twenty flowers, four or five out at a time ; flowers 3½ inches diameter, bright orange self. Primulinus grandiflorus type. Raised by Messrs. Dusinberre.

***Gladiolus 'Marjorie Styles.' A.M.** August 4, 1938. Raised and sent by Messrs. Unwin. 4 feet, unbranched, with twenty flowers, seven or eight out at a time ; flowers 4½ inches diameter, rich claret, lower petal shaded crimson. Primulinus grandiflorus type.

* Award made after trial at Wisley.

***Gladiolus 'Royal Gold.'** **H.C.** July 22, 1938. From Messrs. Wakeley. 4¼ feet, branched, with sixteen to eighteen flowers, four or five out at a time; flowers 5 inches diameter, soft pale creamy-yellow with a deeper throat. Large-flowered type. Raised by Messrs. W. Pfitzer.

***Gladiolus 'Ruby Gem.'** **H.C.** July 22, 1938. Raised and sent by Messrs. Unwin. 3½ feet, unbranched, with fourteen to sixteen flowers, four or five out at a time; flowers 3½ inches diameter, deep rich bronzy-crimson, margins paler, lower petals flushed maroon. Flowering from July 10. Primulinus grandiflorus type.

***Gladiolus 'Spirit of St. Louis.'** **H.C.** July 22, 1938. From Messrs. Bath, Wisbech. 3½ feet, branched, with fourteen to sixteen flowers, four or five out at a time; flowers 4¼ inches diameter, intense orange, lower petal feathered scarlet, throat cream speckled scarlet. Flowering from July 13. Primulinus grandiflorus type. Raised by Messrs. Mueller.

***Gladiolus 'Tip Top.'** **A.M.** August 4, 1938. From Messrs. Konynenburg & Mark, Noordwyk, Holland. 4½ feet, branched, with twenty flowers, four or five out at a time; flowers 5½ inches diameter, deep rich scarlet, lower petals crimson. Large-flowered type. Raised by Messrs. W. Pfitzer.

Odontoglossum grande var. citrinum. **A.M.** September 19, 1934. From Messrs. Sanders, St. Albans. The usual chestnut-brown markings are entirely absent, the flowers being rich lemon-yellow with citron blotching.

***Phlox paniculata 'Viking.'** **A.M.** September 13, 1934. Raised by Messrs. Goos & Koenemann. Sent by Messrs. Blackmore & Langdon, Forbes, and Van Tubergen. Height 2¾ feet; plant vigorous; inflorescence somewhat loosely panicled, free flowering; flowers $1\frac{3}{10}$ inch in diameter, rose-pink, eye of a deeper shade. A late-flowering variety, resistant to eelworm attack.

Rose 'Hazel Alexander.' **A.M.** September 19, 1934. From Messrs. Dicksons, Edinburgh. A crimson Hybrid Tea variety resulting from a cross between 'Ophelia' and 'Richmond.' The flowers are large, long and very sweetly scented. The plant appears to be a vigorous grower.

***Salvia farinacea 'Blue Bedder.'** **A.M.** September 9, 1934. From Messrs. Watkins & Simpson, London. Plant of compact, erect habit, branching at and above base, 3 feet tall; foliage medium green, narrower than type; flower spikes many, freely produced, erect, wiry, downy, 18–20 inches long, much tinged bluish, flowers closely arranged in whorls, deep lavender-blue, calyx downy, giving a white mealy appearance. A good true and even stock, much superior to and of more compact habit than the type.

Sophrolaeliocattleya × 'Ramona' var. 'Anita.' **A.M.** September 11, 1934. From N. Prinsep, Esq., The Boxes, Pevensey Bay, Sussex.

* Award made after trial at Wisley.

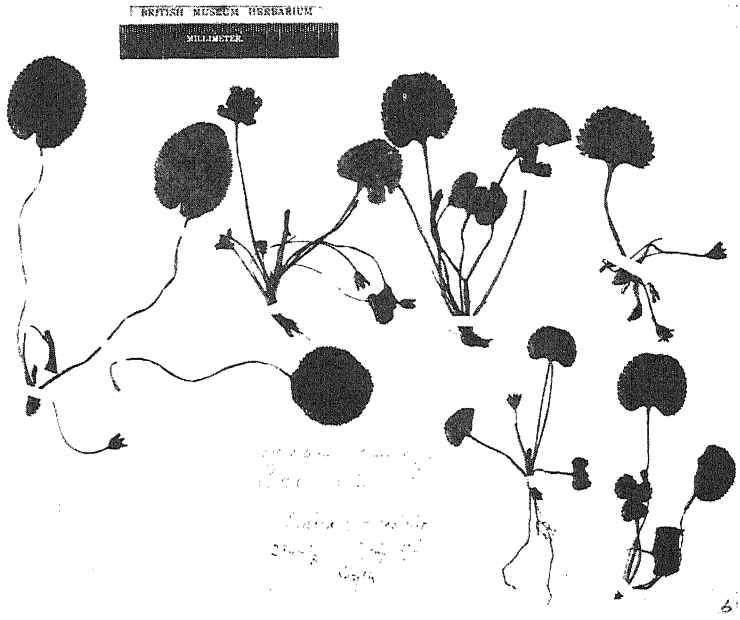


FIG. 139.—PRIMULA CLARKEI.
Photograph of type specimen in the Herbarium, Natural History Museum.

[*To face p.* 492.

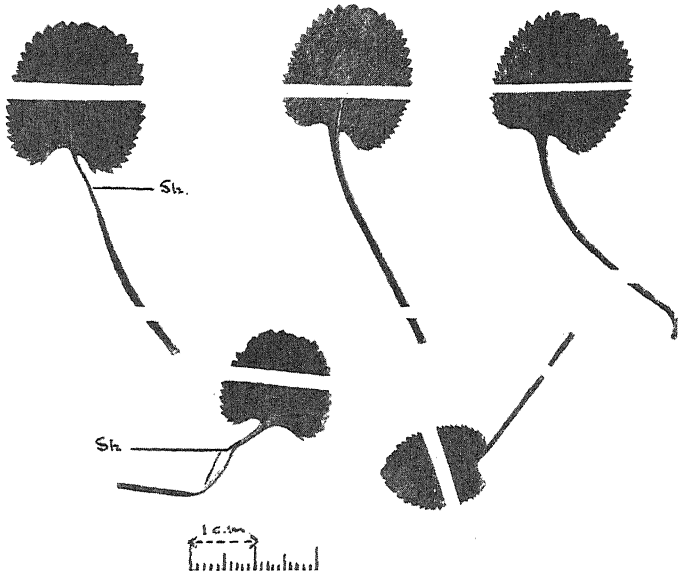


FIG. 140.—HALF-DRIED LEAVES FROM PLANTS SHOWN IN FIG. 142.
Showing the shrinking of the petiole on drying (sh.).



FIG. 141.—PRIMULA CLARKEI.
From herbarium specimens of plants grown at Edinburgh,
a and c, with scapose inflorescence.

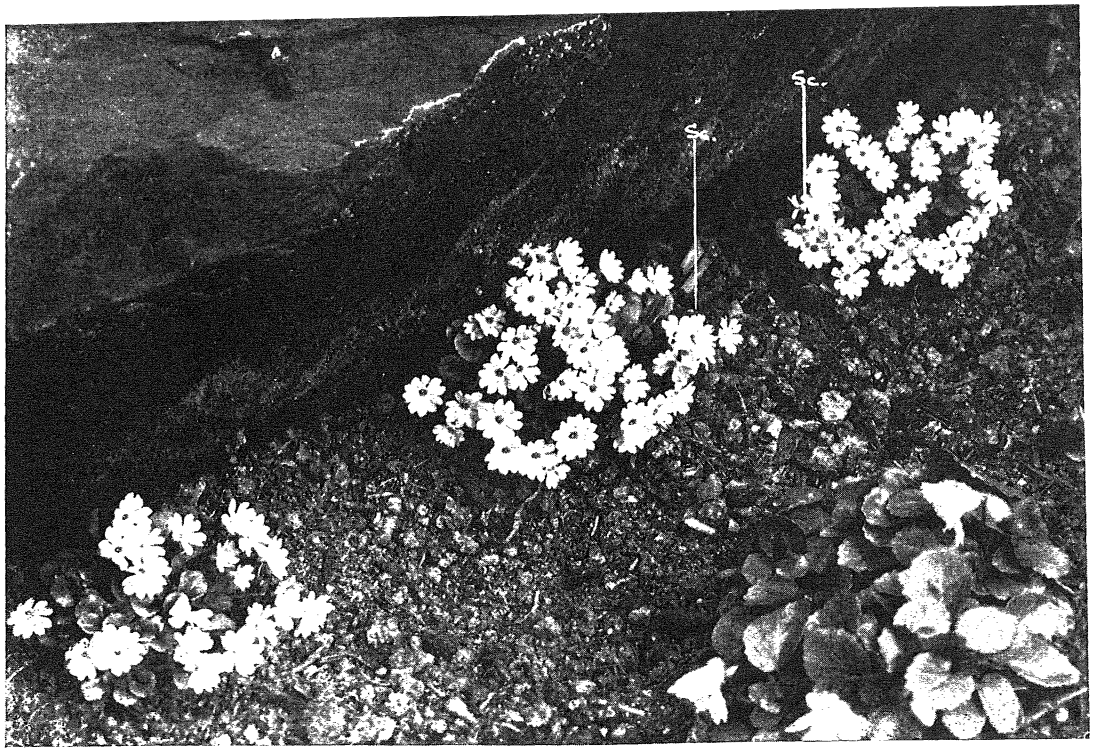


FIG. 142.—PRIMULA CLARKEI IN DR. STOKER'S GARDEN.

[*To face p.* 493.

L.-c. × 'Linda' × *S.-l.-c.* × 'Meuse.' Flower reddish-purple, of medium size.

Sorbus scalaris. A.M. September 19, 1934. From Messrs. Wallace, Tunbridge Wells. A very handsome Mountain Ash from Western China. The rigid, pinnate leaves have nearly thirty elliptical leaflets, serrate in the upper half and glaucous beneath. The small, orange-red berries are borne in dense, flat panicles up to 5 inches across.

Tricyrtis hirta. A.M. October 23, 1934. From Mr. W. Wells, jun., Merstham. An uncommon, late-flowering herbaceous plant from Japan for the wild garden or shady border with moist, peaty soil. The arching stems reach a height of 3 feet, and bear ovate-lanceolate, stem-clasping leaves 4 inches long. The bell-shaped, axillary flowers have pearly-white segments an inch long, heavily spotted with purple, as are also the prominent anthers.

***Tropaeolum 'Golden Gleam.' A.M.** September 5, 1934. Raised and sent by Messrs. Bodger Seeds, Ltd., El Monte, California, U.S.A. Also sent by Messrs. Burpee, Philadelphia, U.S.A.; Messrs. Watkins & Simpson, London; Messrs. Hurst, London; Messrs. Herb, Naples, Italy; and Messrs. Morris, Birmingham. Described in the JOURNAL R.H.S. **58**, p. xxiii.

***Tropaeolum 'Scarlet Gleam, Fusilier Stock.' H.C.** September 5, 1934. Raised and sent by Messrs. Hurst, Houndsditch, London. Of semi-trailing habit; foliage bright green; flowers large, semi-double, less double than those of 'Golden Gleam,' deep rich scarlet, slightly scented.

Vitex Agnus-castus. A.M. September 11, 1934. From Lady Leconfield, Petworth, Sussex. A handsome shrub or small tree, usually requiring the shelter of a wall, although the specimens exhibited were grown in an open border. The dark green leaves are palmate with five to seven lanceolate leaflets of unequal size, the longest over 4 inches long. The tubular, lavender-coloured flowers are densely clustered in terminal spikes or panicles.

* Award made after trial at Wisley.

HARDY BORDER CARNATIONS AT WISLEY, 1937.

IN continuation of the trials reported in our JOURNAL, October 1937 (vol. **62**, p. 456), the Joint Committee for Border Carnations and Picotees met on July 19 and July 28, 1937, to examine the 119 varieties growing in the trials. All the stocks (planted in the second week of October 1936) had made good growth, and the Joint Committee recommended the Awards indicated below.

Varieties to which awards were made in 1936 are retained in the Standard Collection unless they are reported below as now discarded, and the names of new varieties since added are given in their proper classes.

The full list of varieties in the trials can be ascertained by comparing the former report and this.

White Selfs.

Inez (raised by A. G. Weeks, Esq., introduced by Messrs. Lowe & Gibson, and sent by Messrs. J. L. Gibson, Cranleigh, Surrey). **H.C.** July 28, 1937.—28 inches. Plant of vigorous bushy habit, free flowering; flower stems stout, rigid; flowers 2½ to 2¾ inches diameter, full centred; petals broad, entire, white; calyx strong.

Cottage White. **H.C.** July 28, 1937.—See R.H.S. JOURNAL **62**, 456. (**C.** 1936.)

The following varieties have been discarded:

BORDER WHITE.
EDENSIDE WHITE.
ELAINE.
FLORENCE TURNER.

Yellow Selfs.

The following variety has been discarded.:

MARY MURRAY.

Apricot Shades.

Effie Deans (sent by Messrs. Allwood). **H.C.** July 28, 1937.—26 inches. Plant vigorous, of slightly spreading habit; flower stems stout, rigid; flowers 2½ inches diameter, freely produced; petals broad, entire, pale pinkish-apricot; calyx strong.

Nancy Churcher (raised by Mr. J. L. Gibson, introduced and sent by Messrs. Gibson, Cranleigh). **H.C.** July 28, 1937.—2½ feet. Plant vigorous, of rather spreading habit; flower stems stout, rigid; flowers 2¼ inches diameter, freely produced; petals broad, entire, deep rich scarlet-apricot; calyx strong.

Loyalty (sent by Messrs. Allwood). **C.** July 28, 1937.—1½ foot. Plant vigorous, of bushy habit, producing good "grass"; flower

stems rigid; flowers 2¼ inches diameter, freely produced, centre somewhat full; petals broad, entire, bright apricot; calyx strong.

The following varieties have been discarded:

AKBAR, C. 1936. MRS. A. T. KEMBLE.

Pink Shades.

Teviotdale. **A.M.** July 28, 1937.—See R.H.S. JOURNAL **62,** 458. (C. 1936.)

Alpink (raised and sent by Messrs. Allwood). **H.C.** July 28, 1937.—26 inches. Plant of vigorous, bushy habit. Flowers 2½ inches diameter, of good form, centre somewhat open; petals broad, entire, bright cerise-pink; calyx strong.

Rose Bradwardine (sent by Messrs. Allwood). **H.C.** July 28, 1937.—2 feet. Plant vigorous, of bushy habit, with stout, rigid stems. Flowers 2½ inches diameter, freely produced, of good form; petals broad, entire, bright rose-cerise; calyx strong.

Cottage Supreme (raised and sent by Messrs. Allwood). **C.** July 28, 1937.—16 inches. Plant of compact, bushy habit. Flowers 2 inches diameter, centre full, free flowering; petals broad, very slightly fringed, light shell-pink.

Eglantine Clove (sent by Messrs. Allwood). **C.** July 28, 1937.—1½ foot. Plant of rather spreading habit. Flower stems stout, rigid. Flowers 2¼ inches diameter, freely produced, centre rather loose; petals broad, entire, rich scarlet-cerise.

The following varieties have been discarded:

COTTAGE ROSE. DORA SPENLOW.

Scarlet Shades.

Pasha (sent by the R.H.S.). **A.M.** July 28, 1937.—20 inches. Plant vigorous, of bushy habit, with stout, rigid flower stems. Flowers 2½ inches diameter, freely produced, of good form, centre rather open; petals broad, entire, bright scarlet; calyx strong.

Montrose. **H.C.** July 28, 1937.—See R.H.S. JOURNAL **62,** 458. (C. 1936.)

The following varieties have been discarded:

COTTAGE SCARLET, C. 1936. RIFLEMAN.

Old Rose.

Miss Rose Josephs. **H.C.** July 28, 1937.—See R.H.S. JOURNAL **62,** 459. (C. 1936.)

Crimson Shades.

The following variety has been discarded:

CELIA SMITH.

Mauve and Lilac Shades.

Mrs. H. A. Knapton. **A.M.** July 28, 1937.—See R.H.S. JOURNAL **62,** 460. (C. 1936.)

Glen Shee. **H.C.** July 28, 1937.—See R.H.S. JOURNAL **62,** 460. (C. 1936.)

Cottage Mauve (raised and sent by Messrs. Allwood). **C.** July 28, 1937.—2 feet. Plant of rather spreading habit with stout, rigid stems. Flowers 2½ inches diameter, freely produced, centre rather full, somewhat clove-scented; petals broad, entire, rich lilac-mauve calyx strong.

Lavender Clove (raised and introduced by Mr. L. A. Lowe, sent by Messrs. Allwood). **C.** July 28, 1937.—26 inches. Plant of spreading habit, with stout, rigid stems. Flowers 2¼ to 2½ inches diameter, freely produced, centre rather crowded; petals broad, entire, lilac-mauve flushed rose; calyx strong.

Fancies.

Harmony (raised, introduced and sent by Messrs. Allwood, Haywards Heath). **A.M.** July 28, 1937.—2 feet. Plant of vigorous, bushy habit, with stout, erect, rigid flower stems. Flowers 2¾ inches diameter, of good form and freely produced, somewhat clove-scented, centre full; petals broad, entire, light heliotrope, banded and striped bright scarlet-cerise; calyx strong. This variety received **F.C.C.** July 20, 1937.

Ida Gray. H.C. July 28, 1937.—See R.H.S. JOURNAL **62**, 461. (**C.** 1936.)

Margaret (sent by Messrs. Allwood, Haywards Heath). **H.C.** July 28, 1937.—22 inches. Plant vigorous, of bushy habit, with stout, rigid flower stems. Flowers 2⅝ inches diameter, freely produced, centre rather full; petals broad, entire, deep crimson flaked maroon; calyx burst.

The following varieties have been discarded:

DIPLOMAT. SAM GRIFFITHS, **C.** 1936.

White Ground Fancies.

Alice Forbes. F.C.C. July 28, 1937.—See R.H.S. JOURNAL **62**, 461. (**A.M.** 1936.)

Florence Wellstead. A.M. July 28, 1937.—See R.H.S. JOURNAL **62**, 463. (**C.** 1936.)

Bourock (raised and sent by R. M. Grier, Esq., Barrhead). **H.C.** July 28, 1937.—2 feet. Plant vigorous, of bushy habit, with stout, rigid flower stems. Flowers 2¼ inches diameter, of good form, centre rather loose, freely produced; petals broad, entire, white lightly pencilled dull mauve; calyx strong.

John Stobart (raised by Mr. G. D. Murray and sent by Messrs. Gibson). **H.C.** July 28, 1937.—2½ feet. Plant of somewhat spreading habit, with stout, rigid flower stems. Flowers 2½ to 2¾ inches diameter, of good form, centre rather open, freely produced; petals broad, almost entire, white pencilled and lightly flaked rose-cerise; calyx strong.

Robustus (raised and sent by Messrs. Allwood). **H.C.** July 28, 1937.—1½ foot. Plant vigorous, of very bushy habit, with stout, rigid

flower stems. Flowers 2½ inches diameter, freely produced and of good form; petals broad, entire, white edged and flaked at margins scarlet; calyx strong.

Bookham Beau (raised by Mr. J. Douglas and sent by Messrs. Allwood, Haywards Heath). **C.** July 28, 1937.—1½ foot. Plant vigorous, of bushy habit with stout, rigid flower stems. Flowers 2 to 2¼ inches diameter, freely produced, centre rather open; petals broad, entire, white much flaked with scarlet.

Cottage Fancy (raised and sent by Messrs. Allwood). **C.** July 28, 1937.—22 inches. Plant vigorous, of bushy habit with stout, rigid flower stems. Flowers 2⅜ inches diameter, centre rather full, freely produced; petals broad, crenate, white edged and narrowly flaked crimson-maroon; calyx strong.

Pauline (raised by Mr. E. M. Stephenson, introduced and sent by Messrs. Gibson). **C.** July 28, 1937.—2 feet. Plant vigorous, of bushy habit, with stout, rigid flower stems. Flowers 2¼ inches diameter, freely produced, centre rather loose; petals broad, entire, white heavily edged and flaked with rosy-crimson; calyx strong.

The following varieties have been discarded:

BARBARA MORRIS. LUCY GLITTERS.
CURLEW.

Yellow Ground Fancies.

W. H. Brooks. A.M. July 28, 1937.—See R.H.S. JOURNAL **62**, 464. (**C.** 1936.)

Ben More. H.C. July 28, 1937.—See R.H.S. JOURNAL **62**, 464. (**C.** 1936.)

Dainty. H.C. July 28, 1937.—See R.H.S. JOURNAL **62**, 464. (**C.** 1936.)

Zebra (sent by Messrs. Allwood). **H.C.** July 28, 1937.—26 inches. Plant of rather spreading habit, vigorous, with stout, rigid flower stems. Flowers 2½ to 2¾ inches diameter, freely produced, of good form, centre rather open; petals broad, entire, pale creamy-apricot, flaked and edged crimson; calyx strong.

Betty Thain (raised and sent by R. Thain, Esq., Guildford). **C.** July 28, 1937.—2 feet. Plant vigorous, of somewhat spreading habit, with stout, rigid flower stems. Flowers 2⅝ inches diameter, freely produced, centre somewhat open; petals broad, margins crenate, sulphur, flaked towards the margins light cerise; calyx strong.

Juna (raised and sent by Messrs. Allwood, Haywards Heath). **C.** July 28, 1937.—2 feet. Plant vigorous, of somewhat bushy habit, with stout, rigid flower stems. Flowers 2¾ inches diameter, freely produced, slightly clove-scented, centre somewhat open; petals broad, entire, pale sulphur, flaked and lightly suffused rose-cerise; calyx strong.

The following varieties have been added to the trial and are retained:

HADRIAN, **A.M.** 1936. ZEPHYR.
LORD LONSDALE.

The following varieties have been discarded :

CLEMENT.	LINKMAN, **H.C.** 1936.
GOLDEN RAY.	SKIRMISHER.

Picotees.

Fair Maiden (sent by Messrs. Allwood, Haywards Heath). **H.C.** July 28, 1937.—2 feet. Plant vigorous, of bushy habit, with stout, rigid flower stems. Flowers 2½ inches diameter, freely produced, of good form, centre somewhat open ; petals broad, entire, white very narrowly edged scarlet ; calyx strong.

The following varieties have been added to the trial :

PINK BRAES.	RENEE NICHOLS, **F.C.C.** 1936.

The following variety has been discarded :

RED BRAES.

ANNUAL CARNATIONS AT WISLEY, 1937.

SEVENTEEN stocks of Annual Carnations were included in this trial and the seeds of all were sown on February 18, 1937. The resulting seedlings were planted out on May 20, 1937, 12 inches apart, in rows 18 inches apart, and they began to flower in August.

They were judged by the Floral Panel on August 19. Except where noted, all plants in each stock were double-flowered. The stocks named 'Early Perpetual-flowered' (Carter) and 'American Carnations mixed' (Engelmann) did not mature their flowers in the season.

Flowers White.

ANNUAL CARNATION IMPROVED WHITE (Allwood).—Plant 2 feet tall, bushy habit; flowers double, 2¼ inches diameter, white; calyx burst. Contained crimson-flowered rogues.

Flowers Yellow.

ANNUAL CARNATION IMPROVED YELLOW (Allwood).—Plant 2 feet tall, of bushy habit; flowers double, 2 inches diameter, sulphur; calyx burst. A true stock.

Flowers Pink.

ANNUAL CARNATION IMPROVED DEEP FLESH PINK (Allwood).—Plant 20 inches tall, of very compact, bushy habit; flowers 2½ inches diameter, rich flesh-pink; calyx burst. Contained white-flowered rogue.

Flowers of Rose Shades.

ANNUAL CARNATION IMPROVED ROSE (Allwood).—Plant 2 feet tall; flowers 2¼ inches diameter, rich rose; calyx burst.

ROSE QUEEN (Sluis en Groot).—Plant 2 feet tall; flowers 2¼ inches diameter, rich rose; calyx burst. Contained single and pink-flowered rogues.

Flowers of Scarlet Shades.

Annual Carnation Improved Red (introduced and sent by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath). **H.C.** August 19, 1937.—Plant 2 feet tall, of bushy habit; flowers double, 2¼ inches diameter, bright rich scarlet; calyx burst. A true stock.

Giant Etincelant (raised and sent by Messrs. Sluis en Groot, Enkhuizen, Holland). **A.M.** August 19, 1937.—Plant 1½ feet tall, of very bushy habit; flowers double, 2¼ inches diameter, bright rich crimson-scarlet; calyx strong. A good stock.

Flowers Crimson.

ANNUAL CARNATION IMPROVED CRIMSON (Allwood).—Plant 2 feet tall; flowers double, 2¼ inches diameter, crimson; calyx burst. A true stock.

Flowers of Various Colours.

Annual Mixed (raised and sent by Messrs. Carters Tested Seeds, Raynes Park, S.W.). **A.M.** August 19, 1937.—Plant 2 feet tall, of bushy habit; flowers double, of various colours, 2½ inches diameter; calyx burst.

New Giant Malmaison (raised and sent by Messrs. Watkins & Simpson, Drury Lane, Covent Garden, W.C.). **H.C.** August 19, 1937.—Plant 2 feet tall, of bushy habit; flowers double, 2¼ inches diameter, of various colours; calyx burst.

Giant Chabaud reselected Mixed (sent by Messrs. Nutting, London). **H.C.** August 19, 1937.—Plant 2 feet tall, of bushy habit; flowers double, 2¼ inches diameter, of various colours; calyx burst.

Giant Chabaud Mixed (raised and sent by Messrs. Sluis en Groot, Enkhuizen, Holland). **H.C.** August 19, 1937.—Plant 2 feet tall, of bushy habit; flowers double, 2¼ inches diameter, of various colours; calyx burst.

MADAME CHABAUD (W. H. Simpson).—Plant 1½ foot tall, of very bushy habit; flowers double, 2¼ inches diameter, of various shades on a yellow ground; calyx burst.

CHABAUD MIXED (W. H. Simpson).—Plant 2 feet tall; flowers 2¼ inches diameter, double, of various colours; calyx burst.

CHABAUD GIANT MIXED (Ferry-Morse).—Plant 2 feet tall; flowers 2¼ inches diameter, double, of various colours; calyx burst. Contained single-flowered plants.

BOOK REVIEWS.

"Plant Viruses." By Dr. K. M. Smith. 8vo. ix + 107 pp. (Methuen, London, 1935.) 3*s.* 6*d.*

The author's name will be well known to readers of our JOURNAL in connexion with the diseases of plants now attributed to viruses, and his lucid account of these viruses and the diseases they bring about will be welcomed. The great amount of information he gives is conveyed in language as simple as the subject allows, without circumlocution, and with due regard to a sense of proportion. Even the very intricate methods of separating various viruses occurring in a single plant are clearly explained.

Only the broad symptoms of attack are, of course, described, and for more the reader may find what he seeks in the numerous publications which are referred to in the course of the book and catalogued at the end.

It is a book which will enlighten without boring, and ensure for its reader an understanding of a new aspect of knowledge of the causes of some widespread and destructive diseases of cultivated plants.

"The Garden in Color." By L. B. Wilder. 4to. 317 pp. Col. ill. (Macmillan, New York, 1938.) 31*s.* 6*d.*

"The Garden in Color" is a comprehensive collection of notes of between three and four hundred plants. The book is divided into four parts, and the plants are described according to the time of year at which they produce their best colours.

The subjects dealt with include plants of every type: herbaceous, shrubby, bulbous, alpine, annual, aquatic and greenhouse—even the toadstools are not forgotten. *Amanita Muscaria* is described, but not "encouraged" for "innocent" gardens.

The notes are well written, with tender appreciation of the plants and with useful advice as to cultivation and situation, and where possible some history of the plant is given.

The volume is profusely illustrated with coloured plates, practically every plant mentioned being pictured. These illustrations are in some cases satisfactory. Plate 28, *Saxifraga oppositifolia*; Plate 49, *Ribes Gordonianum*; Plate 77, *Oxalis adenophylla*; Plate 87, Lilac President Grévy give a fair idea of the plants or blossoms, and the flowers of the Dahlias and Chrysanthemums are well depicted.

There is a rather misty picture of *Iris reticulata* Cantab, which is said in this book to have originated in the garden of Mr. E. H. Bowles. It is to be hoped that the initials are a printer's error, for the familiar letters "E. A. B." must be too famous in all the garden world for there to be any doubt about them.

A number of the plates are unsatisfactory. In some instances the colour is too pallid, e.g. Plate 9, *Jasminum nudiflorum*: in this country the flowers of this invaluable winter-blooming plant are not pale buff-cream; and few people would wish to introduce *Rhododendron hippophaeoides* into their gardens from the recommendations of Plate 35. Many of the reproductions are successful with the actual flower but fail with the foliage, and a large number are blurred or out of focus.

The book makes a handsome volume. The letterpress is clear and well set up on good paper and merits more successful illustrations.

A vast field has been covered in the preparation of the notes, which has been carefully done, and the resulting information is of real service.

It is pleasant to be reminded of an old friend such as Fuchsia 'Andenken.' Many years ago this variety was always grown in a well-known garden where the head gardener, a Scotsman, always labelled it 'Ann Duncan.'

LADY LAWRENCE.

"Plant Form and Function." Ed. by F. E. Fritsch and E. J. Salisbury. 8vo. 668 pp. Ill. (G. Bell, London, 1938.) 17*s.* 6*d.*

In the preface it is stated that the authors have combined in this volume two of their previous works, well known to students and teachers, viz. "An Introduction to the Study of Plants" and "An Introduction to the Structure and Reproduction of Plants." The subject matter has been brought up to date and the scope extended so that the book now forms a suitable text for university students in their first year.

The authors succeed in presenting a well-balanced account of the plant world, and have fitted neatly the subject matter of the two books into a pleasing mosaic. The reader is introduced to various groups of plants, and with each is shown the structure of the organism in relation to its mode of life and environment. To assist in the appreciation of structure there are many illustrations, both drawings and photographs. The experiments carried out to elucidate the mechanism and the function of the tissues are on the whole quite simple, and the use of elaborate and complicated apparatus which many students fail to assemble satisfactorily has been avoided.

The earlier chapters deal with the flowering plants, and include a brief biochemical consideration of their valuable products. As might be expected from the pen of an authority on the algae, the chapters dealing with these simple plants form a lucid and accurate account, and there are three dozen or so illustrations which will also be greatly appreciated, but the magnifications are too often omitted. The fungi selected for study are primarily those of economic importance—many causing garden diseases.

In The Living Garden Professor Salisbury has already charmingly introduced many readers of this Journal to the study of plants in their garden environment. There are interesting chapters in the present book dealing with the natural habitats of British plants. Recent investigations concerning root development conducted by Professor Salisbury and others, are briefly mentioned. There are excellent illustrations to the chapters dealing with ecology and particularly the succession and associations of plants. Many of these the author has himself made. The study of heredity and evolution is not omitted; the salient features of recent phases of genetical and cytological research are presented. There is a brief section concerned with fossil plants in which the reader is introduced to the vegetation of the past.

Concluding chapters deal with the classification of British plants, and an appendix contains prescriptions for making reagents.

M. A. H. TINCKER.

"Wild Flowers in Britain." By Robert Gathorne-Hardy. 8vo. 120 pp. Ill. (Batsford, London, 1938.) 8*s*. 6*d*. net.

"It may be that your visit is to a village by the sea, above which towers a shapeless hill whose slopes are aglow with *Ulex Gallii*. . . . Below one are trembling bogs in which lurk *Utricularia*, and then sea-wards there is a strip of emerald-green turf and yellow sand . . . offering deep crimson-flowered *Orchis pyramidalis*. Then there is the zone of the tawny orange fucus-covered rocks and the opalescent sea. . . ." So wrote Dr. Druce prefacing a book that most readers would consider extremely dull and dry. Yet for one moment it lifts a veil and shows the living reality that underlay his industry and the bright images that flashed through his mind as he compiled his long and exhaustive records of our flora. It is this exciting and enjoyable aspect of botany that concerns Mr. Gathorne-Hardy. For once a book on wild flowers has been written not to improve our minds but to increase our pleasures. We are taken about Britain and shown its plants by an enthusiastic and delighted guide who is one of those fortunate (yet in this age, frowned-on) people who know what they like. As a result we have an enjoyable as well as a most informative survey of our wild flowers as they grow. It should well serve the reader "with an eager but in this matter unlearned mind" as also those who, like the author, combine amateur botanizing with their gardening.

It is tolerantly prejudiced, and the author invariably goes his own way, usually with every justification. For instance he insists quite rightly that Rockrose is the English name of *Helianthemum*, not Sunrose, a book-name without standing that certain modern authors have bullied us into writing if not speaking. He defends, too, the usual popular application of Bulrush to *Typha latifolia* and not to *Scirpus lacustris* as the books would have it. But surely the transference of the name Harebell from *Scilla nutans* to *Campanula rotundifolia* is hardly a "newfangled" change. Incidentally, many authors agree with him in deploring Hairbell.

The book is well produced and singularly free from typographical and other errors. One would say, however, that *Prunus Cerasus* is now universally applied to the rarer dwarf cherry, the common wild cherry or Gean being *P. Avium*.

There are one hundred excellent photographs. The wrapper and four plates in coloured lithography as well as many line drawings are by John Nash. Many are beautiful and most are very attractive, even if ingenuity of design or pattern at times overwhelms the subject. Lithographers will delight in the artist's handling of the medium.

M. HADFIELD.

" Das Gärtnerische Saatgut." By G. Gentner. 8vo. 93 pp. Ill. (Ulmer, Stuttgart, 1938.) Paper covers. RM. 2.60.

This is Heft 44 of a series of books in German dealing with the various aspects of garden cultivation, its particular subject being garden seeds and their treatment. Some useful tables giving numbers of seeds in a given weight, best temperature for germination, and special favourable conditions and much other valuable information are scattered through the book and a section is devoted to the treatment of orchid seeds and seedlings.

" How to exhibit Flowers, Fruit and Vegetables." By B. W. Lewis. 8vo. 28 pp. (Laurie, London, 1938.) Paper covers. 6*d*.

The little " Guide for Amateur Gardeners with an Index to Monthly Gardening Operations " will be welcomed by many for it contains, very concisely stated, useful hints on preparing plants for exhibition and for avoiding mistakes in interpreting schedules.

" La Mortola Garden: in Memoriam." By Lady Hanbury, Signor E. Mario and Car. L. Maurizio. 4to. lxvi + 158 pp. + 58 plates. (University Press, Oxford, 1938.) 28*s*.

This illustrated catalogue of the plants cultivated in the famous garden of La Mortola is a fine memorial of Sir Thomas Hanbury and Sir Cecil Hanbury. This beautiful garden has been created by the forethought and imagination of a father and son in some seventy years. An arid hillside with a poor calcareous soil has in these years been transformed into a most lovely garden. There are some interesting illustrations at the end of the book showing sketches by Sir Thomas's brother, Daniel Hanbury, of the site of the garden in 1867 when Sir Thomas first started the garden and photographs of the garden as it is to-day. It is not perhaps possible to show the real beauty of the garden in these photographs. The great Eucalyptus trees, palms and collection of Acacias with Banksian roses, *Clematis Armandii* and Wistaria growing over and among them have to be seen to be truly appreciated. Sir Thomas Hanbury got together a great collection of plants. The Australian and New Zealand plants which have now grown to maturity are a feature of great interest and beauty. There are many good specimens of Acacias; there are two delightful photographs of *Acacia cyanophylla* and *A. Hanburyana*, a hybrid raised by the late head gardener. Sir Thomas was particularly keen on the different Citrus species and the La Mortola collection of these plants is probably unique in Europe. It is to be hoped that this interesting collection will not be allowed to deteriorate and will be kept up to date. The Aloes, Cactus and other succulent plants are well represented and there are some fine old specimens in the garden. It is really very wonderful what has been achieved on this poor calcareous soil and this volume is a monument to that achievement.

" Historic Gardens of England." By Lady Rockley. 8vo. xii + 261 pp. Ill. (Country Life, London, 1938.) 7*s*. 6*d*.

This might be called " Glimpses of Great Gardens " for it reproduces illustrations of portions of a number which have appeared in Country Life from time to time, with a brief note on the chief external features of the house and of the garden depicted.

The first part of the book (68 pages) is a summary by Lady Rockley of her well-known History of Gardening in England. Ninety-six gardens are illustrated, all in England save Bodnant.

" Experimental Garden Science." By G. H. Holroyd. 8vo. viii + 88 pp. (Warne, London, 1938.)

This is an endeavour to provide a series of simple experiments to demonstrate to school children some of the phenomena to be observed in the garden.

Unfortunately the directions are not always clear and in many instances the experiments are not scientifically conceived.

" Herb-Lore for Housewives." By C. Romanné-James. 8vo. 264 pp. (Herbert Jenkins, 1938.) 6*s*.

Although a trifle too " olde worlde " in parts, the book contains a good deal of herb lore, and the writer is obviously an enthusiast on the subject of herbs. The greater part of the book is devoted to the uses of herbs and there is some

practical information on the making of syrups, decoctions, electuaries, ointments and liniments. Most of the recipes are from a notebook written by the author's great-grandmother, and the farmhouse recipes have been collected from many sources. In these hurried days there is little time for the complicated processes of past centuries, but many simple recipes have been incorporated and these the modern housewife should find both interesting and useful. There is also a large number of recipes that can scarcely be described as herbal, but nevertheless useful—recipes for jams, preserves and pickles, ways of keeping fruits, recipes for catsups, dairy recipes, invalid beverages, sweetmeats and goodies, and household recipes ranging from how to mend broken china and making black ink to preventing a door creaking.

Various popular errors are repeated. For instance that Hyssop was the plant used by the priests in Biblical times to cleanse lepers. It is, however, very doubtful which plant was the Hyssop of the Bible, and many authorities incline to the belief that the plant was one of the Marjorams. The one thing that is certain is that the Hyssop of the Bible was not *Hyssopus officinalis*. In any case *H. officinalis* is not a native of Palestine.

E. S. ROHDE.

"The Alpine House and its Plants." By Stuart Boothman. 8vo. 131 pp. (Rush & Warwick, Bedford, 1938.) 5*s*. net.

Hard on the heels of a book on the "Alpine House," written by a keen amateur, follows an issue on the same subject from the hands of a professional. It is at all times instructive to compare the methods of these two types of gardeners. The author appears to be mildly interested in his subject, but he warms up as a keen plantsman, who knows his trade. Mr. Boothman gives a readable, useful and sober account, for which relief much thanks. Rhapsodical literature on Horticulture can be very tiresome. Our only complaint is the suggestion of a general clean-up in winter, possibly the worst period, and the repetition of the time-wasting process of stacking seed pans, each covered with a disc of asbestos.

His list of plants is condensed, but he gives advice on cultivation, and in this respect we consider the book as more valuable for the beginner and there is information which an old hand will be glad to accept.

Mr. Boothman is right in saying that the plant which received an **A.M.** in 1936, under the name of *Campanula pilosa*, was not the true species, but a form of *C. lasiocarpa*. Apparently he has never seen the true *Dianthus callizonus*, or he would not consider the species as practically identical with *D. alpinus*. Indeed, the pink with the beautiful girdle is quite different from *D. alpinus* in flower, more so in leaf and, if suited, in longevity. Of course, this is a big "If." It is scarce in cultivation and sometimes a tricky plant, but when happy, a very good one. Jankaea provides no problem of cultivation except that the ever-increasing rosettes will not produce sufficient flowers. It is the single crown which will bloom and until we can induce the specimen plant to do its best, it remains a much overrated species.

More careful checking of Latin names would have enhanced the value of the book.

P. ROSENHEIM.

"Beautiful Flowering Shrubs, Trees and Heather." By G. C. Nuttall. Revised by R. Luff. 8vo. xiii + 260 pp. Col. ill. (Cassell, London, 1938.) 15*s*.

This book is already well known and it has now been revised by the inclusion of some of the newer species and varieties. The coloured illustrations of shrubs are a feature of the book, and on the whole give a good idea of the plants portrayed. The names of plants have as a rule been carefully dealt with, but why *Magnolia Soulangiana* should be dubbed "The Cucumber Tree" is difficult to understand, as is the omission of that finest of white heaths *Erica carnea* Springfield White, now widely enough spread to find a place in all lists of hardy heaths.

"Garden Bulbs in Color." By J. Horace McFarland, R. Marion Hatton and Daniel J. Foley. 8vo. xxiv + 296 pp. Ill. (Macmillan, New York, 1938.) 15*s*. net.

This lavishly illustrated book is a companion volume to "Roses of the World in Color" and "Garden Flowers in Color" previously published, and like those is mainly composed of the fine series of remarkable photographs of living plants collected by the Mount Pleasant Press for use in the illustration of catalogues.

Only two or three of the pages are without an illustration, and many have two, three or more smaller coloured or black-and-white pictures, and all are photographs of the living plants.

The colouring is mostly about the average found in reproductions of photographs. Especially good are those of Dahlias, Tulips and Lilies, and also the sprays of Montbretias, and the groups of Nerine and Ranunculus.

The yellow of Daffodils has, as usual, proved difficult. The fine rich orange tint of 'Emperor' on p. 73 makes one wish that it was so well favoured in life. The other portrait named 'Emperor' on p. 63 is even more gloriously arrayed, but the narrow trumpet and long, pointed perianth segments show that some other variety sat for the portrait.

The camera also viewed 'Olympia' and 'Whistler' through a lens of extra rose-coloured glass. The black-and-white plate of 'Aerolite' as growing and lit by sunlight is a beautiful picture. The Tulips with white or grey backgrounds are preferable to those framed in, or bursting out of, black squares which, however, suit some Lilies and Gladiolus spikes.

The text is pleasantly informative, although severely condensed, and aims at practical instruction for cultivation and grouping rather than a picturesque style, but a fanciful poem finds space in the chapter devoted to Gladiolus.

Though written for Amercian gardeners, their English brethren can learn from its pages and find pleasure in recalling the colouring of favourite flowers when looking at such a wealth of portraits contained in one book.

NOTES AND ABSTRACTS.

Anthericum Salteri. By F. M. Leighton (*Fl. Pl. S. Afr.*, t. 687 ; Jan. 1938).—A strongly scented new species from Namaqualand, up to 8 inches high, with broad leaves up to $\frac{3}{8}$ inch wide transversely plicate, with up to fourteen folds more marked towards their apices.—*M. S.*

Babiana cuneifolia Baker. By G. J. Lewis (*Fl. Pl. S. Afr.*, t. 685 ; Jan. 1938).—A plant native in Little Namaqualand about $3\frac{1}{2}$ inches high, with curiously truncate, short, broad leaves, the apex brown and rough as if grazed off. Violet-purple flowers in June and July in S. Africa.—*M. S.*

Babiana spiralis Baker. By G. J. Lewis (*Fl. Pl. S. Afr.*, t. 686 ; Jan. 1938).—Native in the Cape Province; a graceful plant about $8\frac{1}{2}$ inches tall, with long almost linear leaves twisted spirally towards the apex. Flowers blue, fading to pale mauve and pink, produced in August and September. Closely resembles *Gladiolus striatus* Jacq.—*M. S.*

Billbergia pyramidalis Lindl. By E. J. Alexander (*Addisonia*, vol. 19, t. 625 ; March 1936).—A native of S. Brazil, epiphytic, with a rosette of ten to twelve leaves and purplish-scarlet, violet-bordered flowers in an erect, dense-flowered thyrse.—*F. J. C.*

Cestrum, Monograph of [Monographie de genre *Cestrum* L.]. By P. Francey (*Candollea*, vol. vi, pp. 46–398 & *to be continued* ; 1935).—This paper gives a short account of the morphology and geographical distribution of the American genus Cestrum, followed by a key and detailed descriptions in Latin of 205 out of the 256 species recognized as distinct. The genus divides into two sections ; Habrothamnus, with red-purple or orange flowers, including *Cestrum Endlicheri* (*H. corymbosus* ; *Bot. Mag.* t. 4201), *C. aurantiacum*, *C. Regelii*, *C. psittacinum* (*Bot. Mag.* t. 9158), *C. Newelii*, *C. elegans*, etc., and Eucestrum, a much larger, less ornamental group usually with white, yellowish or greenish flowers, including *C. calycinum* (*C. viridiflorum* ; *Bot. Mag.*, t. 4022), *C. diurnum* (*C. fastigiatum* ; *Bot. Mag.*, t. 1729), *C. Parqui*, etc. Among the many new species is *C. cultum*, apparently unknown in a wild state, but cultivated in Egypt, Algeria and Java, resembling *C. elegans* in its inflorescence and *C. Parqui* in its flowers, which are however violet.—*W. T. S.*

Costus Malorteanus Wendl. By E. J. Alexander (*Addisonia*, vol. 19, t. 628 ; March 1936).—A Costa Rica plant with large leaves handsomely barred with deep green and covered with silky hair. Flowers fleeting, orange with orange-red veining. Requires a very moist atmosphere.—*F. J. C.*

Cotyledon hirtifolium. By W. F. Barker (*Fl. Pl. S. Afr.*, t. 690 ; Jan. 1938).—A new species from Little Namaqualand belonging to the group Paniculatae, differing from other members of the group in its persistently pubescent leaves and the inclusion of the stamens in the corolla-tube. Nearly $2\frac{1}{2}$ feet high, with yellowish-green flowers, and leaves which fall at flowering time.—*M. S.*

Crocus laevigatus Bory et Chaub. By B. L. Burtt (*Bot. Mag.*, t. 9515; April 1938).—The plate shows *C. laevigatus* var. *Fontenayi* of Bowles's Handbook of Crocus. The colour range of the species is very wide from white to dark mauve striped purple. [The colour range of the perianth is not stated in the description nor is the flowering season given.]—*F. J. C.*

Cypripedium japonicum Thunberg. By V. R. Summerhayes (*Bot. Mag.*, t. 9520 ; April 1938).—Only *C. formosanum* besides this has two large leaves on the scape and that is distinguished from *C. japonicum* by its glabrous instead of hirsute stem. The flower is green except for the large pink labellum. Native of Japan and Szechwan and hardy with some protection in bad weather.—*F. J. C.*

Daphne Genkwa Sieb. et Zucc. By H. Teuscher (*Addisonia*, vol. 19, t. 627; March 1936).—A well-known species with lilac flowers. Propagated by cuttings taken low but without a heel, and as soon as growth ceases while still soft, and inserted in moist sand in a double pot. Probably best in partial sand.—*F. J. C.*

Gaultheria Wardii Marquand et Shaw (*Bot. Mag.*, t. 9516; April 1938).—An evergreen species from Tibet, Assam and Upper Burma, producing freely clusters of white flowers and deep purple fruits about ⅛ inch across. The leaves, about 2½–3 inches long, lanceolate, are covered below with dense rusty indumentum. It forms a bush about 5 feet high and is apparently hardy.—*F. J. C.*

Geissorhiza namaquensis. By W. F. Barker (*Fl. Pl. S. Afr.*, t. 688; Jan. 1938).—A new species from Little Namaqualand, flowering from August till September, with long flower bracts and perianth tubes, and firm leaves with closely set ciliate nerves. Up to 10½ inches high, with deep blue flowers.—*M. S.*

Gladiolus Stanfordiae L. Bolus. By J. Hutchinson (*Bot. Mag.*, t. 9522; April 1938).—Native of South-east Africa, a species with a close spike of delicate pink short-tubed flowers, the side segments shorter than the middle ones.—*F. J. C.*

Helianthus tomentosus Michx. By E. J. Alexander (*Addisonia*, vol. 19, t. 626; March 1936).—A perennial herb up to 4 feet in height with dark green coarsely toothed leaves and lemon-yellow flowers with the rays rather loose and twisted, and long, spreading involucral bracts. Hardy. Native of Appalachian Mts., Virginia, etc.—*F. J. C.*

Hesperantha pauciflora Baker. By G. J. Lewis (*Fl. Pl. S. Afr.*, t. 682; Jan. 1938).—Native in Namaqualand and the Cape Province. Up to 14 inches high, with slender lanceolate leaves, and sparse spikes of two to four generally small and insignificant pale mauve-pink flowers produced in July. Placed by Baker in the genus Tritonia, but now relegated to Hesperantha on account of its long style-branches spreading from the throat of the perianth tube.—*M. S.*

Homeria Pillansii. By L. Bolus (*Fl. Pl. S. Afr.*, t. 684; Jan. 1938).—A new species from the Cape Province closely allied to *Homeria Marlothii*, differing by its narrower leaf, its larger, brighter-yellow perianth segments, which are broadest above the middle instead of below, and its slightly twisted inner perianth segments. Flowers during September and October in S. Africa.—*M. S.*

Sempervivum, Notes on. By W. B. Turrill (*Bull. Soc. Bot. Bulgarie*, vol. vii, pp. 124–127; 1936).—This paper supplements Praeger's Account of the Sempervivum Group (1932). *Sempervivum Kosaninii* has a fairly wide distribution in north Macedonia and eastern Montenegro and may prove conspecific with *S. marmoreum* (*S. Schlehanii*) since plants of intermediate character occur. Material from Mount Athos (type-locality of *S. marmoreum*) shows that *S. marmoreum* Griseb. (1843) and *S. Schlehanii* Schott (1853) belong to one species for which the prior name *S. marmoreum* should be adopted. Among the plants collected by Dr. Giuseppi at Armchi in the Caucasus at 5,000 to 6,500 feet is a new species here described as *Sempervivum altum* Turrill, with rosettes 4 cm. (? more when older) across of oblanceolate abruptly acuminate leaves shortly glandular-hairy all over, 1·9 cm. long, 8 mm. broad, ciliate, a flowering stem 33 cm. high bearing many linear-lanceolate glandular-hairy leaves and a many-flowered branched fairly dense glandular-hairy inflorescence of pale reddish-purple flowers 2·6–3 cm. across, their petals narrowly or linear-lanceolate, 1·2 cm. long, 2·5–3 mm. broad, and glandular hairy, their stamens with purple filaments, yellow anthers and yellow pollen. It is closely related to *S. Kosaninii* but differs in being a much larger plant, the stem taller and the flowers much bigger, with yellow (not pale red) anthers and non-contiguous broadly semi-oblong scales 0·5 mm. long.—*W. T. S.*

Strawberry Tarsonemid Mite (Tarsonemus fragariae Zimm.), **Further Observations on the.** By A. M. Massee (*Ann. Rept. East Malling Res. Stat.*, 1932, pp. 117–131; 3 plates).—The distribution and host plants of the Strawberry Tarsonemid Mite in Great Britain and in Europe are given. A closely allied species, *Tarsonemus pallidus* Bks., produces similar symptoms of damage on Strawberry in Canada and in the United States.

Notes are given on the life cycle arranged under paragraph headings, viz.: the Breeding Season, the Occurrence of Males, the Eggs, the Adult and Immature Mites, the Hibernation Period, and the Dissemination of the Mites.

The types of damage on established plants and on runners are described, while the effects upon the plants are explained.

Twelve varieties of Strawberries are recorded as hosts—'Royal Sovereign,' 'King George V,' 'The Duke' and 'Sir Joseph Paxton' being frequently very severely attacked, and 'Oberschlesien,' 'Madame Kooi' and 'Laxtonian' being only slightly attacked.

Control measures are referred to at length, and the results of trials show that such measures as the spraying of established plants, dusting, dipping of runners before planting, and the fumigation of the plants with hydrocyanic acid gas have not proved efficient.

The immersion of runners in hot water at 100° F. for twenty minutes was found to be the most satisfactory method of sterilization prior to planting.

The possible association of the Mite with other Strawberry diseases, and as a possible vector of the virus disease known as 'The Strawberry Yellow-Edge Disease' are referred to briefly.—*G. F. W.*

Tradescantia, Species of, indigenous to the United States. By E. Anderson and R. E. Woodson (*Contrib. Arnold Arb.*, no. ix, 132 pp.; 22 maps, 12 plates; 1935). —A detailed revision of the Tradescantias, or Spiderworts, occurring wild north of Mexico. A survey of the literature from Bauhin (1623) and Parkinson (1629) to the present day is followed by an account of structure (pp. 13–29), species differentiation and hybridization (pp. 29–43), and a key to the species and detailed descriptions (with synonymy, citations of specimens, etc.) of each (pp. 44–118). Twenty-two maps illustrate geographical distribution. For their identification the showy but very fugitive corolla offers few characters; a wide range of colour from blue to magenta and less frequently white may occur in a single colony of certain species. The form, size, colour and hairiness of the leaves and sepals, the height and habit of the whole plant, certain seed characters, and the thickening of the roots and persistence of root-hairs in various species, are considered more significant. The study of the genus in the field and herbarium (material from thirty-seven collections being examined) has been accompanied by breeding and cytological work. *Tradescantia virginiana* and its close relatives are self-sterile (*i.e.* a single plant will not set seed with its own pollen), while many species cross readily when brought together. Thus garden stocks must necessarily become impure if raised from seed produced where single plants of several species are grown side by side as is usual in botanic gardens. Dr. Anderson "has never seen a *Tradescantia virginiana* in a European garden which could unhesitatingly be referred to that species," most of the plants under this name showing unmistakable evidence of mixture with *T. canaliculata* (syn. *T. reflexa*) and *T. subaspera* (syn. *T. pilosa*). Back-crossing in Nature between hybrids and parental species has undoubtedly complicated the taxonomy of the genus and does not seem to have been sufficiently appreciated in the past. Many of the species are polyploid or include polyploid strains; tetraploid and diploid hybrids are semi-fertile, though with less fertile pollen than the parental species, while triploid hybrids (resulting from the crossing of diploids and tetraploids) are sterile or nearly so. *T. micrantha*, a creeping species from Texas useful for hanging-baskets in greenhouses, seems never to set seed. Of the twenty-two species recognized, five (*T. ozarkana*, *T. Tharpii*, *T. Ernestiana*, *T. paludosa* and *T. longipes*) are new. *T. longipes*, known to residents of south-east-central Missouri as "wild crocus," is a beautiful, almost stemless species with narrow, deep green, hairy, sprawling leaves 14–22 cm. long and purplish-rose pedicels and somewhat petal-like purplish-rose sepals which are attractive even when the broadly ovate, rose, blue or purplish petals have withered. There are a few changes in nomenclature: *T. pilosa* Lehm. is replaced by *T. subaspera* Ker-Gawl. (this is the largest American species), *T. reflexa* Raf. by *T. canaliculata* Raf. (the commonest, most widespread and apparently most variable species), while *T. congesta* (Moench) Penny and *T. brevicaulis* Raf. are included in *T. virginiana* L. Possibly the plants grown under these names in European gardens are not correctly determined or are hybrid derivatives.

W. T. S.

Tulip, the Scarlet, of the East. *Tulipa oculus-solis.* By Sir A. D. Hall (*Gard. Chron.*, vol. xcv, pp. 406–8, with 2 figs., and pp. 424–5).—An examination of the nomenclature and claims to specific rank of a dozen Scarlet Tulips from Persia, Syria and Turkestan, and also the stoloniferous clones *T. oculus-solis* and *T. praecox* naturalized in S. Europe.

The view is upheld that *Tulipa oculus-solis* St. Amans 1784, should be regarded as the prior and specific name for the group in preference to *T. montana* Lindley, hitherto commonly used.

The triploids *T. praecox* and the Syrian *T. Boissieri* should, however, be accorded specific rank as well as the Turkestan species *T. kuschkensis*, *T. Hoogiana* and *T. lanata*.—*E. A. B.*

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FORTHCOMING EVENTS.

THE principal horticultural events of the year are past, but the remaining Shows will give opportunities, among the exhibits of good autumn plants, shrubs, etc., of obtaining ideas for the improvement of the gardens for the coming year, and there will be orchids and fruit exhibited as well as other plants.

Fellows who have keen gardening friends may like to remind them that they can join the Society now and enjoy free Fellowship for the remainder of the year, new subscriptions paid now covering the whole of the year 1939.

Here are a few of the arrangements for 1939:

The Daffodil Show will be held on April 13 and 14; the Early Market Produce Show on April 13 and 14; the Chelsea Show on May 17, 18 and 19, the Fruit and Vegetable Show on October 10 and 11, and there will be a programme of competitive classes throughout the year.

An interesting programme of lectures has been arranged on such subjects as Dahlias, Pelargoniums, Fuchsias, Sweet Peas, Daffodils, on "How plants have found their homes," on "The Modern Garden," and on plant collecting expeditions, etc.

Attention is drawn to the new publications of the Society in these notes and they should not be forgotten as suggestions for gifts at the Christmas season.

CALENDAR.

On November 8 (12 noon to 5 P.M.) there will be a Fortnightly Show at which a flower arrangement competition for amateurs will be held, the rules being:—

> One vase, bowl or other receptacle of cut flowers and/or ornamental fruits arranged by the exhibitor in the exhibition

hall without any assistance. Any natural foliage may be used, but no artificial, dyed or surface-coloured flowers, fruits, or foliage, ribbon, coloured paper or other decorative artificial material may be included in any exhibit. The material used need not have been grown by the exhibitor. For further details, see special regulations for the competition, obtainable from the Secretary.

The second Masters Memorial Lecture, on "The Behaviour of Plants," will be given by Mr. F. J. CHITTENDEN, F.L.S., V.M.H., in the Lecture Room at 3.30 P.M. on November 8.

Practical demonstrations on the Planting of Fruit Trees and Roses will be given on November 9 and 10, between 2 and 4 P.M. at Wisley, weather permitting. Fellows wishing to attend these demonstrations are asked to let the Director of the Gardens know beforehand, mentioning which day.

On November 29 (12 noon to 5 P.M.) there will be a Fortnightly Show in the New Hall, and in the Old Hall the British Carnation Society will hold their Show (1 to 7.30 P.M.), and on November 30 (10 A.M. to 5 P.M.).

On November 29, in the Lecture Room of the New Hall at 3.30 P.M., Dr. Tincker will lecture on "Growth Substances and Horticultural Practice."

The last demonstration of the year, namely, on Pruning Fruit Trees, will be given at Wisley on December 7 and 8 (2 to 4 P.M.), weather permitting. The Director of the Gardens should be advised of those wishing to attend.

The last Fortnightly Show of the year will be held on December 13 (12 noon to 5 P.M.) in the New Hall.

FRUIT FOR NAMING.

At this time of the year the Fruit Committee is asked to name a large number of apples, pears, etc., and a good deal of correspondence arises owing to the instructions for sending fruit being overlooked. They are again repeated:

"Send at least three perfect specimens of a variety. Do not send until the fruits are mature, and then choose specimens representative of the particular variety. Avoid sending bruised, diseased or abnormal fruits. Include with each variety a typical shoot with foliage. Number each variety, preferably in Roman figures, by marking the skin with a hard pencil, and keep a record of the tree from which it is gathered. Labels are often displaced during transit. Wrap each fruit in paper and pack it carefully and securely in wood-wool or similar material. Flimsy cardboard boxes are usually crushed in the post, while scented-soap boxes taint the fruit and obscure its characteristic flavour. Give all the information you can respecting the age of the trees and how

they are grown, *e.g.* indoors or out, as cordons, bushes, or standards, etc."

It is a convenience if specimens are sent so as to reach the office by the first post of the morning of a show day.

PICTURES, PLANS, PHOTOGRAPHS, ETC.

With the approach of winter, arrangements are made for the display of pictures and photographs of plants, flowers and gardens, and plans and models of gardens. These articles may be shown at the Shows on November 29, December 13, January 10 and 24, and February 7. Inadvertently, in the October JOURNAL, February 21 was mentioned. This being the date of the Annual Meeting in 1939, at which floral exhibits are so great, no space will be vacant.

HORTICULTURAL SUNDRIES.

The exhibition of Horticultural Sundries will be allowed at the Fortnightly Shows on November 29, if space is available, December 13, 1938, January 10 and 24, 1939.

LINDLEY LIBRARY.

Fellows are reminded once more of the conditions under which they may borrow books from the Lindley Library :

The Library is open daily (Sundays and holidays excepted) from 10 A.M. to 5 P.M. (Saturdays 10 A.M. to 1 P.M.). On Show days the Library will remain open until the close of the Show, except on two-day Shows, when it will be open until 6 o'clock on the first day of the Show.

The right of closing the Library at any time for purposes of re-arrangement, cleaning, etc., is reserved. It will be closed annually for two weeks, usually between the first and second fortnightly meetings of the Society in July, in order that the books may be cleaned and the stock inspected. During this period Fellows will be able to consult books but not to borrow them.

The Fellows of the Society have access to the Library at all times when it is open.

Gardeners and others, not Fellows or Officers of the Society, must make application to the Secretary for permission to use the Library and must enter their names and addresses in a book provided for that purpose.

Anyone requiring the loan of a book to be taken from the Library must make written application to the Secretary, and loans will be granted on the following conditions, viz. :

(*a*) That the borrower be personally known to one or more of the Officers of the Society, or produce satisfactory references.

(*b*) That the borrower sign a receipt for the volumes in a book provided for the purpose, before removing them from the

premises, or if unable to attend, acknowledge the receipt on a postcard; and undertake to restore the books in good condition and to comply with the regulations.

(*c*) That not more than three volumes be lent to one person at one time.

(*d*) That borrowers through the post pay the postage both ways.

A certain discretion will be used as to what books shall be lent, but rare books, which it would be difficult to replace, periodicals, expensive illustrated works and works of reference which are likely to be in frequent requisition within the Library itself may not be removed from the premises.

No books may be sent to Fellows resident abroad.

All books borrowed must be returned to the Library in good condition within one calendar month from the date of issue, and if sent by post must be properly protected and packed, but an extension of time may be granted on application.

The Secretary is empowered to demand of the borrowers such books as are detained beyond the prescribed time, and to take such steps as may be necessary to secure the prompt return of the same.

The loss of any book or any damage must be made good by the borrower.

Fellows requiring books on loan from the "Outlier" Libraries should make written application either to the Secretary of the Society or to the National Central Library for Students, Malet Street, London, W.C. 1.

The Trustees reserve the right of repealing or altering any of these regulations from time to time as may be required.

Catalogues.

At this season of the year Fellows will be receiving new catalogues and the Librarian would like to remind them that the Society maintains in the Lindley Library a collection of catalogues, not only of the past, but also of the present, and he would be grateful if Fellows, when turning over their accumulation of catalogues, would think of the Library and forward any that they do not want to the Secretary.

Catalogues of the past are often useful in providing evidence of the introduction of new plants or even the date of the raising of a new variety.

Publications.

"Flowering Trees and Shrubs." The report of the Conference that was held in April of this year is now published and is available, bound, to Fellows at the price of 7*s*. 6*d*. and to non-Fellows at 10*s*., plus postage. It is well illustrated and forms an excellent companion volume to Some Good Garden Plants. The popularity of the latter book has called for a second printing and it is hoped that this new book will attain the same result.

"Some Good Garden Plants." A guide to the choice of plants likely to succeed in gardens in most parts of the British Isles—a guide to plants which have proved their worth and hardiness, are not difficult to procure, are of outstanding merit in their class, and do not require very special treatment to bring out their excellences. Price, paper cover, 4*s*.

The Daffodil Year-Book for 1938 is likewise now available, the price being 5*s*. in limp cover, and 6*s*. in stiff cover.

The R.H.S. Diary, appearing for its twenty-eighth year, will also be obtainable this month. The price is 2*s*. 2*d*. post free, in Pluviusin with back loop and pencil; 3*s*. 8*d*. post free in Morocco leather (not refillable) with pencil; or 5*s*. 2*d*. post free in refillable Crocodile Case with card and stamp pockets.

The first volume of the Horticultural Colour Chart, concerning which there has been much delay, should now have been distributed to subscribers and will now only be obtainable at 1 guinea a copy.

Hall Lettings.

A Missions Sale of Work will be held in the Old Hall on November 16 and 17, particulars of which may be obtained from Mr. A. W. Bartlett, 6 New Square, Lincoln's Inn, W.C. 2.

The Women's Institutes Exhibition will be held in the New Hall from November 16 to 23. Particulars may be obtained from the Hon. Frances M. Farrer, National Federation of Women's Institutes, 39 Eccleston Street, London, S.W. 1.

On November 23 and 24 Our Dumb Friends' League will hold their annual Fair in the Old Hall. Inquiries should be addressed to the Secretary, Our Dumb Friends' League, 72 Victoria Street, S.W. 1.

A "Merry Market" will be held on December 7 and 8 in the New Hall in aid of the Gt. Ormond St. Hospital for Sick Children. Inquiries should be addressed to The Hon. Margaret Bigge, 25 Connaught Square, London, W. 2.

Wisley in November.

Autumn frosts have by this time destroyed most of the later outdoor flowers, including the Chrysanthemums, Michaelmas Daisies, Dahlias, and those in the herbaceous border, but the Gardens nevertheless will not be entirely lacking in colour or interest for visitors.

On the rock garden such plants as the creeping *Polygonum affine* and *P. vaccinifolium*, the scarlet *Schizostylis coccinea*, belated Gentians, the Japanese Maples with their richly coloured dying leaves, the species of Crocus by the Alpine house and *Saxifraga Fortunei* within its shelter all contribute to brighten the end of the garden year. Autumnal colour in the wild garden should be even more conspicuous, where grow the Vacciniums, especially *Vaccinium virgatum* and *V. corymbosum*, *Liquidambar styraciflua*, an American tree with Maple-like foliage, the Royal Fern (*Osmunda regalis*), species of

Enkianthus turning either yellow or scarlet at this season, the lovely Chinese Maple, *Acer griseum*, *Pieris mariana*, *Clethra alnifolia*, and other shrubs notable for their leaf tints. In the open ground of Seven Acres are other examples of this attractive habit, particularly *Parrotia persica*, a small tree at the western end, various species of Cornus, of which the best is probably *Cornus Baileyi*, a native of N. America, the Scarlet Oak (*Quercus coccinea*) which holds its red leaves after all others have fallen, *Viburnum Sargentii* resembling our own native *V. Opulus*, and no doubt others if the weather is kind to us. Berried shrubs too will be found here, including the many species and hybrids of Berberis, the Spindle Trees (species of Euonymus) and Cotoneasters, but Rose species whose hips are so decorative at this season are planted together along the riverside walk in Howard's Field, through the Pinetum at the northern end of the Gardens.

Under the protection afforded by the glasshouses a number of shrubs or plants will be seen in flower. In the large Temperate House Acacias, *Cestrum aurantiacum*, the rich red Heath-like *Epacris ardentissima*, purple *Tibouchina semidecandra* whose branches touch the roof, the small *Fuchsia parviflora* and the climbing *Lapageria rosea* with striking waxy pink trumpets are all usually in bloom this month, many of them having an extended season under these conditions. In the Half-hardy house Nerines, both species and hybrids, will be the chief feature.

NOTES ON DWARF DAFFODILS.*

By Alec Gray.

In the space of an article in the Daffodil Year-Book it is impossible to attempt a comprehensive survey of the dwarf Daffodil species and wild and garden varieties, even if I were qualified for such a task, which I am not. I shall therefore confine myself to some random notes in the hope that they will stimulate some of those who have never grown any of this charming group of plants to make the attempt, and that they will awake fresh interest in the breasts of some of those who have grown them in the past but have given up their cultivation for one reason or another.

Apart from their intrinsic beauty there is another strong reason why every Daffodil lover should grow some, at least, of the dwarf Narcissi, and that is that they enable him to enjoy the society of his favourite flower for a very much longer period than would be the case if he confined himself to the ordinary garden varieties. From the time when *Narcissus Bulbocodium monophyllus* opens its first snowy trumpets in December, to the time when the last moon-yellow flower of *N. gracilis* fades, is some five months, a very respectable time for one family of plants to remain in bloom.

Of course, there are also the Autumn-flowering species to prolong still further the season, but these, *N. serotinus*, *N. elegans* and *N. viridiflorus*, are not for the ordinary gardener. All, so far as my experience goes, suffer from the same failing, a most annoying habit of remaining dormant for a quite indefinite period. To give an example. Three years ago I bought a dozen bulbs of *N. viridiflorus*. The first season six produced a single leaf, but no flowers; next year one bulb died and the remaining eleven refused to be roused from their slumbers. Last year ten still slumbered on, while one produced a single leaf. Neither baking during the summer nor any other treatment seems capable of rousing them once they have made up their minds to sleep.

One often reads that *N. Bulbocodium monophyllus* behaves in the same manner, but this has not been my experience. I have never had any trouble in making the bulbs start into growth at the proper season and they have always flowered and seeded freely. They never get any special treatment except that, if they are in pots, these are given a little more baking in the frame or glass-house in summer than other sorts.

N. Bulbocodium monophyllus (fig. 143) is, to my mind, about the most beautiful of all Daffodils, too frail to withstand the rude caress of the

* Reprinted from the R.H.S. Daffodil Year-Book, 1938.

elements in the open garden, but a perfect joy on dull winter days in a pot in the cold or very cool house.

The sulphur-yellow form collected by the late Sir WILLIAM LAWRENCE in the Atlas Mountains, which seems to be identical with *N. Bulbocodium Romieuxii* (fig. 144) as shown by Mr. STERN and Dr. GIUSEPPI recently at Vincent Square, is almost as beautiful as its white sister, and, as one would expect, is much better adapted to withstand the rigours of our winter. It also increases rapidly by division, which *monophyllus* does not. It is not, however, at present on the market.

The propagation of most of the dwarf Daffodils is apt to be a slow process unless it is possible to raise them from seed. This accounts for the fact that quite a number of the most charming kinds are either unobtainable commercially or are rather expensive.

In the former class is that lovely plant *N.* × *cyclataz*. It is a semi-dwarf rather than a miniature Daffodil, reaching the height of five or six inches outdoors, and eight or nine inches when grown in pots in a cold house, for which purpose it is ideal. Raised in Portugal over half a century ago from the cross *cyclamineus* × Soleil d'Or, it was once listed by several firms, but now seems to have disappeared except from a few private gardens.

Up to a few years ago it seems to have been almost the only hybrid Daffodil with Soleil d'Or blood in it that had ever been raised. Recently, however, other crosses with Soleil d'Or as one of the parents have been flowered, and I myself have a small batch of two-year-old seedlings of which Soleil d'Or is the seed parent.

I imagine *cyclamineus* was the mother of *N.* × *cyclataz*.

It seems a fairly easy plant to grow in the West of England, but its Tazetta blood may make it more difficult in colder parts. With pot cultivation it can be had in bloom very early.

Another plant not in commerce is the exquisite little 'Pencrebar,' registered by Captain HAWKER, which is, in my estimation, far and away the most beautiful of the dwarf double varieties. It does not seem a difficult plant, its chief failing being a tendency to produce blind buds. It is not the only double to suffer from this fault, however.

'Pencrebar' and my own 'Sea Gift' (fig. 145) both have a curious history. Both are evidently dwarf Jonquil hybrids, and both were found growing in old Cornish gardens, the former in the gardens of the house whose name it bears, and the latter in a cottage garden near Helston. Neither, I think, is likely to be of Cornish origin; where 'Pencrebar' came from no one knows, but concerning 'Sea Gift' I was told a romantic tale by an old woman in a neighbouring cottage, which may or may not be true, but is worth recounting.

One wild morning in the bad old days a century or more ago a ship was driven ashore on the coast near Porthleven.

An expectant and not over-scrupulous crowd gathered on the shore to pounce on whatever the waves might cast up. Among the objects the sea gave up was a half-drowned sailor, but it was wreckage



FIG. 143.—NARCISSUS BULBOCODIUM MONOPHYLLUS.
(p. 515)

[*To face p.* 516.

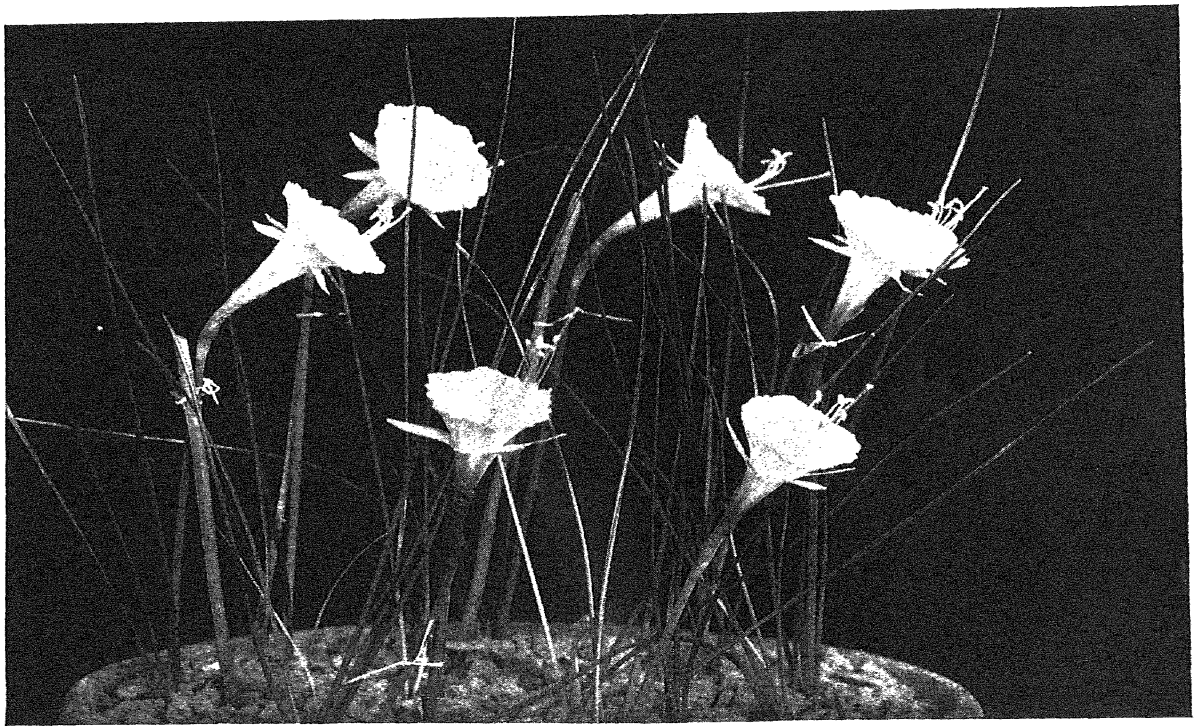


FIG. 144.—NARCISSUS BULBOCODIUM ROMIEUXII.
(p. 516)



FIG. 145.—NARCISSUS 'SEA GIFT.'
(p. 516)



FIG. 146.—NARCISSUS TAZETTA CANALICULATUS AND N. BULBOCODIUM CITRINUS.
(p. 518)

To face p. 517.

and not sailors the crowd was waiting for, and had it not been for a kind-hearted old woman, back into the sea the sailor would have gone, to be quite drowned the next time he came ashore; dead men tell no tales.

The old woman, however, cared for him in her cottage until he was well enough to return to his native land (Was it Spain?). Too destitute to reward her for her kindness he told her he would send her some little present when he was safely home, and in due course a parcel of bulbs arrived, of the variety I have named 'Sea Gift.'

The plant, while sterile, increases fairly rapidly and is absolutely hardy, having endured nearly thirty degrees of frost with me at one time, without suffering any damage.

Another very charming flower, not at present to be found in any bulb catalogues, is the *N. triandrus* and *N. Jonquilla* cross shown at the R.H.S. Hall this year and awarded **A.M.** under the name 'Hawera.' It was raised in N. Zealand by Mr. W. M. THOMSON and sent by him to Wisley. It thrives there and in Mr. BOWLES'S garden at Waltham Cross. Whether it is truly *N. triandrus pulchellus* (if such a plant ever existed) I do not know, but it is certainly the only Narcissus I have ever seen which has a perianth distinctly deeper in colour than the corona, a characteristic ascribed to *pulchellus*, but not found in some of the things distributed under this name, which in my experience are *N. triandrus concolor*.

This remarkable colouring gives a kind of fire-light effect to the flowers which is most attractive; add to this the facts that the flowers of this hybrid have a very sweet Jonquil-like perfume, it is hardy, and a good doer, and we have an entirely desirable plant which deserves to be widely known.

N. triandrus pulchellus is mentioned by some authors as sometimes setting seed, but 'Hawera' seems quite sterile.

N. Jonquilla and *N. juncifolius* are well known, but *N. juncifolius rupicola* is a plant not nearly as widely grown as it should be, as, to my mind, it is more beautiful than the type, from which it differs in bearing only one flower to the scape, which flower has an almost flat corona which is often six-lobed. It is just as sweetly scented as *juncifolius* and is easily raised from seed.

Rather like *N. juncifolius rupicola* in form, but pure white (it is the only white Jonquil) is *N. Watieri*, named after its finder and hailing from Mount Yagour in Great Atlas.

It has only recently been introduced and is still scarce and expensive, but as it seems quite a good doer and seeds well, it may soon become more plentiful and cheaper.

It is an exquisite little thing and can be likened to nothing but fairy porcelain, unless it be to a minute edition of one of Mr. GUY WILSON'S flat-crowned Leedsiis.

Another nice little member of this group is *N. gracilis tenuior*, which is especially useful because the lateness of its flowering period helps to prolong the season. Its pale straw-coloured blossoms are very like

those of *N. gracilis*, but the whole plant is smaller; it shares with *gracilis*, too, an origin wrapped in mystery, for both are unknown as wild plants, and no record exists of when or where they first appeared in gardens.

N. gracilis tenuior has one fault, a fault it does not share with *N. gracilis*, and that is an objectionable habit of going "broody," in other words of splitting into innumerable offsets, each too small to flower. Perhaps I have failed to give it some condition that it needs, but I certainly get a good many more leaves than flowers.

One word of warning is necessary to those who would buy *N. gracilis tenuior*: there are very few true stocks of it about. I have had Dutch stocks of which ninety per cent. were a curious little Jonquil hybrid which seems to be nameless, and splits even more than *tenuior*.

Although not an uncommon plant and very cheap to buy, *N. Tazetta canaliculatus* (fig. 146) is not grown as widely as it should be: apart from the fact that it is the only dwarf 'Tazetta,' the flowers are quite pretty and the scent delightful.

In the West, at any rate, it grows like a weed and increases faster than any Narcissus I know, large or small. I once planted six small bulbs, and three years afterwards lifted 253 of all sizes, and on another occasion planted twelve ounces of bulbs and lifted twelve pounds after two years. It increases so rapidly that I am sure it needs shifting much more frequently than most dwarf sorts, or it will become overcrowded and cease to flower.

I have not, so far, mentioned any members of the large family of dwarf or semi-dwarf Trumpet Daffodils; some are well known, some are not very attractive when compared with other classes, but it is a great pity that the smaller white and pale Daffodils are now so scarce.

'W. P. Milner,' a graceful plant, is now difficult to obtain, and many of the kinds listed fifty years ago have quite disappeared. Poor constitution seems to have been the cause.

The dwarfest of all the white ones, and to me the most beautiful, *N. moschatus* of gardens (*N. alpestris* of Pugsley), seems, I admit, a rather difficult plant and I have never had great success with it, though it is easily raised from seed, but its larger cousin, *N. cernuus* of gardens (and *N. moschatus* of Pugsley), I have always found easy to grow. Unlike so many dwarf Daffodils it increases rapidly by division, so there is no need to resort to seed raising to propagate it.

I am very fond of *N. cernuus plenus*, which may or may not be the double form of *cernuus*, and have never had any trouble with it, though it is reputed to be difficult. It is, however, much slower to increase than *cernuus* and as, of course, it cannot be seeded, it is likely to remain, as at present, a scarce and expensive bulb.

I think, in conclusion, some notes on the cultivation and propagation of the dwarf Narcissi may be of interest. Of course, I can only base my remarks on my own experience. The experience of others, on many points, is probably quite different.

However, I think that nearly everyone will agree with me when

I say that most of the failures one hears of are due to excessive moisture. None of them, I think, will stand very wet conditions for long, in particular if the soil is sticky, though some sorts, such as the Bulbocodiums and *N. cyclamineus*, will thrive in quite damp situations so long as stagnant water is not present.

At the other end of the scale, the *triandrus* varieties and some of the Jonquils thrive best in crevices in the highest part of the rock garden where there is a minimum of soil and moisture.

I do not think many object to extremes of heat and cold, as such, for it must be remembered that the home of most of them is the high places of Spain or Portugal where such extremes are normal; it is the damp cold of our English climate (whether in winter or summer) that they dislike.

For those who wish to make up a suitable soil, whether for the rock garden, pots or boxes, a good mixture is two or three parts good garden soil, or, better still, virgin loam roughly sifted, one part coarse sand, and one part granular peat. Such peat can be bought for five shillings or less per cwt., and is better than leaf-mould, as it is entirely free from weeds and pests.

The addition of lime does not seem to have any effect one way or the other; I have to confess that I have never seen any effect from lime on Narcissi whether used in large or small quantities, on large or small varieties. Neither, I think, will any sort of manure be found beneficial, and anything with nitrogen is definitely harmful. If the soil is on the poor side a little bone meal will do no harm (even if it does not do much good).

Where bulbs are established among other plants which it is desired to feed, a good organic fertilizer should be used such as fish meal, dried blood or real guano, if it can be got. For all Daffodils nothing can compare with virgin soil, and a top dressing of this will do more good than any fertilizer.

As already mentioned, where it is possible, seed raising is by far the most satisfactory method of increasing one's stock of dwarf Daffodils. Of course, this cannot be done in the case of the double sorts, most, if not all, Jonquil hybrids and most triandrus hybrids, including Queen of Spain, but there still remain many other kinds which seed freely and can be grown to flowering bulbs in two to three years.

There are two ways of raising them from seed; they may be allowed to seed themselves where they are already established, or the seed may be gathered and sown in boxes, pans or seed beds.

In the rock garden the former method will, of course, be followed; indeed, it is almost impossible to prevent them seeding themselves, and where they are really happy such sorts as the Bulbocodiums will spread themselves rapidly by such means. It is well, however, not to rely entirely on this means of propagation, as, in the rock garden, the tiny seedlings are very easily mistaken for weeds and destroyed, and garden pests may also take a heavy toll.

Except for the commoner and more robust sorts, it is much safer to gather the seed and sow it in boxes ; they can be kept in a sheltered part of the garden, or, better still, in a cold frame, and are very little trouble beyond an occasional weeding. The very scarce or rather delicate species are desirable enough to warrant a corner in the cold house.

The deeper the box used for the seed the better, not because they need a deep box, but because the deeper the box the less watering required ; four to six inches is an ideal depth.

Place half an inch or so of coarse peat or similar matter over the bottom to ensure good drainage, then fill the box to within half an inch of the top with the mixture already described (which it is well to put through a three-eighths of an inch riddle). Sow the seed thinly and fill the box to the top with the same compost and give a good watering. When the soil has settled I usually cover the surface with about a quarter of an inch of fine peat, which not only helps to conserve the moisture but keeps down moss.

The seed should be sown as soon as possible after it is properly ripe and the boxes stood in the coolest place available, and if possible covered with a few inches of peat or fine soil.

Watering is not important until about the beginning of September, when some seeds begin to germinate : from then on the boxes must be kept moist. As the seedlings of some of the earlier sorts are often above ground early in October, any covering the boxes have had must be removed by this time.

If the seedlings are to be given the luxury of shelter in a frame or house, such protection must only be given for the purpose of warding off excessive moisture, and the vents or lights must be left open day and night except in the most severe weather. Under glass a good soaking of water every week or ten days is far better than small doses at more frequent intervals.

In Spring, at the time the flowers would be fading (if they had any) water can be gradually withheld, and before the end of April the boxes can be taken outside and placed in a shady spot once more for the summer ; the following autumn and winter they should be treated exactly the same as during the first season.

When the foliage dies down for the second time the soil can be tipped out of the boxes, and it will be found that most of the seedlings will have formed bulbs which will flower the following year.

Two warnings may be of use to those who would raise seedlings ; first, when filling the boxes, pick out all the worms possible from the soil : it is very difficult to get rid of them once the seed is sown ; secondly, be sure the boxes are strong enough to last two seasons ; it is very annoying to have the bottom drop out of a nice box of seedlings when you go to lift it off the ground.

Dwarf Daffodils are subject to a certain number of pests and diseases, but not an undue number I think.

Of pests, slugs and woodlice are the worst. These are not only very

fond of the flowers of certain varieties, but delight to nip off the tops of the seedlings as they come through the ground. Meta solid fuel for slugs and Paris Green for woodlice are the remedies. Earwigs are also fond of the flowers, and for these I know of no cure but trapping.

The most prevalent fungus disease is a Botrytis, which attacks the plants at ground level, causing the leaves to turn yellow and rot off at the collar. It also penetrates downwards and destroys the bulb, commencing with outside scales (at least, I suppose it is the same disease which does this, but I am no mycologist). The Bulbocodiums and *triandrus* suffer very badly from this Botrytis at times, but the larger sorts are far less susceptible.

Humid conditions seem to be the predisposing factor where this disease is concerned, and it is for this reason that I have advocated occasional soakings rather than frequent light waterings for those grown under glass. It rarely makes its appearance before the end of February, but a few humid days in March will sometimes cause it to spread very rapidly.

Most of the dwarf Daffodils seem susceptible to eelworm, but should a valuable stock become infected no qualms need be felt about sterilizing them ; two hours even at a temperature as high as 112° seems to do no harm at all even to the smallest bulbs, and most of them do not even suffer flower damage.

Except for the larger semi-dwarf kinds, they seem, as far as my experience goes, to be immune from attack by either of the Narcissus Flies. Perhaps the flies have enough intelligence to realize that a bulb of *minimus* or *triandrus albus* offers too restricted a home and meagre a diet for their offspring.

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

LXXXVI.—Winter Killing of Wallflowers.

By D. Ashworth, Ph.D.

Every season wallflowers are received at Wisley which show withering of one or even all of the branches, and the Ministry of Agriculture's Monthly Bulletins to advisers also frequently mention cases of this kind. Owing to the wilted and withered appearance of the plants the trouble is usually referred to as "dieback." In many instances complaints are received that the trouble has affected very large numbers of plants in formal beds. Attention was more particularly directed to this type of failure by its prevalence in the trial of wallflowers held at Wisley in 1935–36.

The trial referred to consisted of twenty-four varieties comprising forty-eight strains of wallflower. Each strain was represented by forty-two plants. The first failures of plants in the trial were noticed during February 1936, and by the end of the flowering season 207 out of 2,016 plants were affected. The final census taken on May 20, 1936, showed varying incidence of the disease among different varieties and even among strains of the same variety, as the accompanying table shows. Table I gives a list of the varieties included in the trial arranged alphabetically giving the percentage of plants showing "dieback" by the end of the season. Where a variety was represented by more than one strain these are numbered 1, 2, 3, etc. From this table two facts emerge. In the first place, it can be seen that the incidence of the disease varied in different varieties from 2 per cent. in 'Dwarf Bush' to 47 per cent. in 'Feltham Early.'

Secondly, it shows that different strains of the same variety vary greatly, *e.g.* the nine strains of 'Scarlet Emperor' included in the trial showed failures varying from 9·5 per cent. to 33 per cent. The fact that the incidence of the disease varied so much amongst the strains of one variety showed that this was not a true varietal susceptibility as regards disease. It is therefore not possible to say that 'Dwarf Bush' will always show few and 'Feltham Early' many failures, because different strains of these varieties might behave differently.

Bearing in mind the figures in Table I the varieties 'Vulcan' and 'Orange Bedder' were selected for use in further experiments as showing generally a high and low resistance to the trouble.

Description of the disease.—Unless plants are observed very carefully the disease has often reached an advanced stage before the failure is noticed. For example, most of the plants received with

complaints are similar to that shown in fig. 148 where much of the middle of the plant is withered.

TABLE I.

Occurrence of "Dieback" in the Wallflower trial, 1935–36.

Variety.	Percentage.	Variety.	Percentage.
'Bacchus'	7	'Orange Bedder' 1	33
'Blood Red'	7	'Orange Bedder' 2	38
'Blood Red Selected'	31	'Orange Bedder' 3	33
'Dazzler'	31	'Primrose Monarch'	14
'Dwarf Bush'	2	'Primrose Queen'	36
'Early Feltham'	45	'Rose Shades'	19
'Extra Early Feltham'	26	'Rose Queen'	31
'Feltham Early'	47	'Rose Queen Improved'	38
'Fire King' 1	21	'Ruby'	21
'Fire King' 2	26	'Ruby (Giant)'	26
'Fire King' 3	31	'Scarlet Emperor' 1	19
'Fire King' 4	29	'Scarlet Emperor' 2	14
'Fire King' 5	26	'Scarlet Emperor' 3	21
'Golden'	21	'Scarlet Emperor' 4	9·5
'Golden Bedder'	14	'Scarlet Emperor' 5	11
'Golden Monarch' 1	14	'Scarlet Emperor' 6	19
'Golden Monarch' 2	26	'Scarlet Emperor' 7	19
'Golden Queen'	19	'Scarlet Emperor' 8	33
'Goliath' 1	29	'Scarlet Emperor' 9	31
'Goliath' 2	26	'Vulcan'	9·5
'Grenadier'	21	'Vulcan Improved'	5
'Hamlet'	9·5	'Vulcan Tom Thumb'	11
'New Apricot'	16	'Vulcan Giant' 1	9·5
'Othello'	16	'Vulcan Giant' 2	9·5

Under careful observation the disease is seen to start much earlier than this. Usually it first affects a small lateral branch of the plant. This can be distinguished from the rest of the plant by its darker green appearance; the leaves are watersoaked and tend to droop a little (fig. 149). If such a shoot is examined more closely at this stage it will be found that the stem of the shoot about ½ to 1½ inch behind the tip has become wrinkled and contracted whilst the colour of the stem has faded to a pale brownish yellow. This is followed by further wilting and yellowing or whitening of the leaves. Within a week, conidiophores of the grey mould fungus Botrytis develop on the yellowed area of the stem, but not on the leaves, and sooner or later the tip of the branch hooks over (fig. 150). In mild cases only one branch may be affected, but usually the whole plant succumbs branch by branch and finally dies.

The disease is particularly noticeable at flowering time when the elongated flower shoots hook over and later become covered with Botrytis. Sometimes the main shoot of the plant is attacked first (fig. 151) and the failure spreads to the surrounding laterals.

Description of the fungus.—When small portions of these wilted shoots are carefully sterilized in mercuric bichloride, washed in sterile water, and put on to potato or prune agar slopes, within 36 hours a copious white fluffy mycelium appears which produces conidial heads

of Botrytis in three to four days. Within eight to ten days resting bodies, the sclerotia, are formed. These are black irregularly lobed bodies one to five millimetres in diameter, and are found to consist of a fairly loose mesh of colourless hyphae intertwined with one another. Towards the surface a closer rind is formed consisting of two or three layers of hyphae with thickened black walls (fig. 5). These resting bodies can be induced to grow again even when ten to twelve months old. *Botrytis cinerea* was isolated from 39 plants of the variety 'Orange

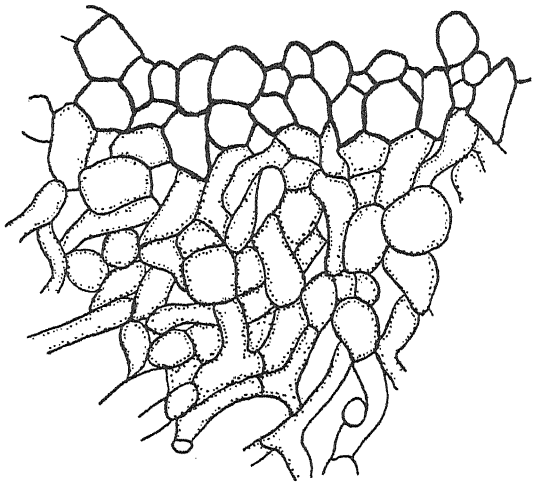


FIG. 147.—SECTION THROUGH A SCLEROTIUM ASSOCIATED WITH "DIE-BACK" IN WALLFLOWER.
The outer rind has threads with thickened walls.
× 580.

Bedder' and 8 of the variety 'Vulcan' during the course of the investigation.

In view of the weakly parasitic nature usually attributed to *Botrytis cinerea* the question now arose as to whether this fungus was the primary cause of the failure.

The parasitism of the fungus was investigated by direct inoculation of injured and uninjured plants of the varieties 'Orange Bedder' and 'Vulcan.' Uninjured plants were not attacked by the fungus when inoculated artificially on the undamaged stem or in the leaf axils and kept in a humid atmosphere for 48 hours. In eight instances the surface of the stem was scratched and in others eight leaves were removed from the plants and the fungus laid on the freshly exposed leaf scar, but in none did the Botrytis gain entry.

Evidence for the non-entry of the Botrytis following injury was obtained in the 1936–37 field experiment by observations of plants which had been nibbled by rabbits. In no case did Botrytis follow this mechanical injury. In another experiment wallflower seedlings of the variety 'Orange Bedder' were sprayed with a suspension of Botrytis spores. The plants were kept in a damp chamber for 48 hours, but none showed symptoms of "dieback," although kept for



FIG. 148.—WALLFLOWER 'ORANGE BEDDER' AFFECTED BY "DIE-BACK." The main shoots and some branches destroyed.

[*To face p.* 524.

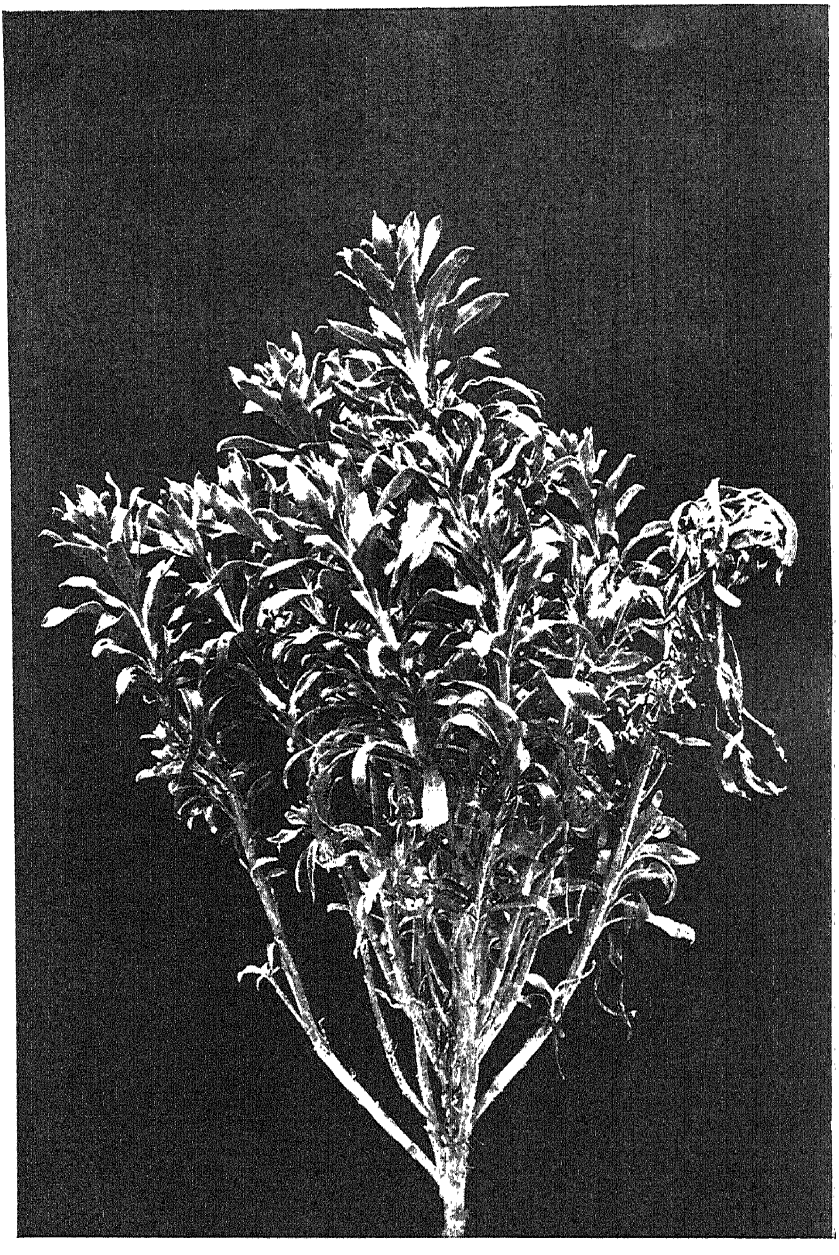


FIG. 149.—WALLFLOWER SHOWING EARLY STAGE OF "DIE-BACK."
The shoot on right with the hooked tip is dead.



FIG. 150.—WALLFLOWERS AFFECTED BY "DIE-BACK."
Showing hooked tips of shoots.



FIG. 151.—WALLFLOWER ALMOST KILLED BY "DIE-BACK."
Two branches only remain healthy.

[*To face p.* 525.

some weeks. A similar experiment in which fragments of sclerotia were used instead of the spore suspension gave the same result.

From these observations it seems evident that the Botrytis will not attack a perfectly healthy wallflower plant and is not usually the primary cause of the trouble.

Field trial 1936–37.—Since *Botrytis cinerea* had been shown to be of secondary importance in relation to "dieback" a field trial was carried out in the season 1936–37. This was planned so as to provide data to determine firstly, whether the incidence of the disease could be correlated with some lack of plant nutrient and secondly, whether it followed some injury such as that caused by frost, weather conditions or damage following Peronospora attack. (Since wallflowers are often damaged by the downy mildew fungus, *Peronospora parasitica*, it was thought that the Botrytis might gain a hold on plants already weakened by attack by this parasite.)

The first test was carried out with artificial fertilizers. Sulphate of potash, superphosphate and sulphate of ammonia were chosen to supply potash, phosphates and nitrogen to the experimental plots. The plot of land available measured 55 ft. by 33 ft. and was conveniently divided into two 15 ft. wide strips by a 3 ft. path. Each of these strips was then subdivided into five, giving two series of five plots, each of which measured 15 ft. by 11 ft. 'Vulcan' was planted on one strip of five plots and 'Orange Bedder' on the other. It was thus possible to compare the incidence of the disease in a variety which had shown a high mortality in 1935 with that of a variety which had shown few failures. The plan of the experiment and rates of manuring are given in Table II.

TABLE II.

Layout of field experiment 1936–37.

55 ft. ×

33 ft.

Vulcan.				
1	2	3	4	5
Sulphate of potash. 1 lb. 12 oz. = 4 cwt. per acre.	Superphosphate. 2 lb. 2 oz. = 5 cwt. per acre.	Sulphate of ammonia. 1 lb. 6 oz. = 3¼ cwt. per acre.	Complete. 5 lb. 4 oz. = 12¼ cwt. per acre.	Control. No manure.
Path.				
Sulphate of potash. 1 lb. 12 oz. = 4 cwt. per acre.	Superphosphate. 2 lb. 2 oz. = 5 cwt. per acre.	Sulphate of ammonia. 1 lb. 6 oz. = 3¼ cwt. per acre.	Complete. 5 lb. 4 oz. = 12¼ cwt. per acre.	Control. No manure.
1	2	3	4	5
Orange Bedder.				

One further factor was considered in planning the experiment. In the use of wallflowers as bedding plants it is usually inconvenient to put the plants into their winter quarters until late September or October as the beds are still occupied with summer flowers. It is, therefore, necessary for the plants to be transplanted twice, once from seed bed to nursery row and from there to flowering quarters. It has been thought that " dieback " in some plants can be attributed to root disturbance and so it was of interest to compare the incidence of the disease in plants which had been transplanted once with those moved twice. The plants were purchased as seedlings and on August 17 were planted out 100 to a plot in nursery rows 6 inches apart with 15 inches between the rows. Though conditions for transplanting were ideal when the work began, an unexpected change in the weather brought hot sunshine later in the day, but the plants were well shaded with bracken and watered at intervals for four days. They established themselves quickly and grew away. Unfortunately, some were damaged later by rabbits and the number of plants on a plot was thus reduced. They were hoed at intervals and carefully cultivated and on October 3 the ' Orange Bedder ' plants were rearranged in the following way. In each plot alternate plants were removed from the nursery rows, thus leaving the others one foot apart, and the plants removed were replanted in new rows on the same plot one foot apart. In a complete plot there were therefore 50 once-transplanted and 50 twice-transplanted wallflower plants growing 1 ft. apart with 15 inches between the rows. The plots containing those of the ' Vulcan ' variety were similarly rearranged on October 4. On October 17 the artificial manures were applied at the rates shown in Table II.

Observations were started at the beginning of October and continued throughout the winter. Approximately fortnightly records of each individual plant were kept so that it has been possible to procure a case-history for each one. Thus, if a particular plant died from Botrytis, reference to these records could determine whether it had been damaged or previously attacked by Peronospora.

Occurrence of Peronospora parasitica.—Peronospora parasitica was the first disease to appear and twelve plants were found to be affected by this fungus on October 5. In all this was confined to a small branch of the plant which could easily be distinguished by the paler colour and distortion of the leaves. Conidia were present on the lower surfaces of the leaves, but in all the attack was slight. There was a considerable increase in the number of plants affected as the season advanced and the final figures for both varieties taken on May 18 are given in the accompanying table (Table III).

In most cases only one or two branches of a plant were affected and in none was death brought about by Peronospora.

From these tables two facts appear. In the first place, the percentage of plants affected by Peronospora was least in the plot which had a dressing of sulphate of potash, and secondly, the disease was most prevalent on those plants which had been once transplanted.

Occurrence of "dieback."—The first cases of "dieback" in the 1936–1937 season occurred in January, 1937. In the census taken on January 12, one plant in the superphosphate plot, three in the sulphate

TABLE III.

Percentage of plants attacked by Peronospora parasitica.

Plot.	Manure.	Variety 'Orange Bedder.'		Variety 'Vulcan.'	
		Once transplanted.	Twice transplanted.	Once transplanted.	Twice transplanted.
1	Sulphate of Potash.	18	30	8	—
2	Superphosphate	30	20	—	4
3	Sulphate of Ammonia	36	24	14	—
4	Complete	36	24	36	12
5	Control	28	16	28	18

of ammonia and three in the complete plot were recorded. In all but the plant occurring in the superphosphate plot these were plants which had been twice-transplanted from the seed bed. By February 11, the

TABLE IV.

Percentage of plants showing "dieback."

Plot.	Manure.	Variety 'Orange Bedder.'		Variety 'Vulcan.'	
		Once transplanted.	Twice transplanted.	Once transplanted.	Twice transplanted.
1	Sulphate of Potash.	4	—	—	2
2	Superphosphate	6	4	—	—
3	Sulphate of Ammonia	14	28	12	10
4	Complete	10	12	16	14
5	Control	4	2	4	—

disease was present in all plots and the number of plants affected increased steadily throughout the season. The final figures taken on May 18 are given in the above table (Table IV).

From these figures it can thus be seen that the "dieback" was most prevalent in plots 3 and 4 which had received the greatest dressings

of nitrogen. These figures do not include those plants in which "dieback" followed on Peronospora. This occurred in thirteen cases.

Field trial 1937–38.—It was thought necessary to obtain still more evidence on the cause of "dieback" in wallflowers and during the winter of 1937–38 a second trial was carried out on the same ground as the previous year, but with some modifications.

Since the disease was seen to be most prevalent on the plots which had received sulphate of ammonia, it was decided to include an extra plot of each variety on which double the dressing of sulphate of ammonia could be applied. The layout of the experiment and the rate of manuring is given in Table V.

TABLE V.

66 ft. × 33 ft.

Vulcan.					
Supplementary.	Plot 1	2	3	4	5
Sulphate of Ammonia. 2 lb. 12 oz. = 6½ cwt. per acre.	Sulphate of Potash. 1 lb. 12 oz. = 4 cwt. per acre.	Superphosphate. 2 lb. 2 oz. = 5 cwt. per acre.	Sulphate of Ammonia. 1 lb. 6 oz. = 3¼ cwt. per acre.	Complete. 5 lb. 4 oz. = 12¼ cwt. per acre.	Control. No manure.
Path.					
Sulphate of Ammonia. 2 lb. 12 oz. = 6½ cwt. per acre.	Sulphate of Potash. 1 lb. 12 oz. = 4 cwt. per acre.	Superphosphate. 2 lb. 2 oz. = 5 cwt. per acre.	Sulphate of Ammonia. 1 lb. 6 oz. = 3¼ cwt. per acre.	Complete. 5 lb. 4 oz. = 12¼ cwt. per acre.	Control. No manure.
Supplementary.	Plot 1	2	3	4	5
Orange Bedder.					

A second modification was that the plants were raised from seed of 'Orange Bedder' and 'Vulcan' sown at Wisley in the last week of June 1937. On August 31 each of the above plots was planted with 25 plants taken direct from the seed drills. The rest of the plants were transplanted to nursery beds at the same time.

The planting of the plots was completed on October 1, when 75 plants were transferred to each plot from the nursery rows. During the month they had been in the nursery rows they had grown quickly and were of definitely soft growth as the ground had been previously occupied by the sweet pea trial.

The experiment thus consisted of twelve plots of 100 plants, each comprising 25 once-transplanted and 75 twice-transplanted wallflowers. The artificial manures were applied on January 20, 1938.

Observations.—Observations of the incidence of Peronospora and

" dieback " in these plots were again made at approximately fortnightly intervals.

Compared with the previous season there was very little Peronospora present in the plots throughout the winter though this showed a slight increase at the beginning of March. The following table shows the distribution of the downy mildew disease throughout the plots. (Table VI.)

The figures are so low that it is not possible to draw any conclusion, though for ' Orange Bedder ' they are the highest.

The occurrence of " dieback " in the plots was evident earlier than in the previous season, and caused far more damage amongst the plants.

TABLE VI.

Percentage of plants affected by Peronospora parasitica.

Plot.	Manure.	Variety ' Orange Bedder.'		Variety ' Vulcan.'	
		Once transplanted.	Twice transplanted.	Once transplanted.	Twice transplanted.
1	Sulphate of Potash. .	16	—	8	4
2	Superphosphate	12	1	—	3
3	Sulphate of Ammonia .	4	5	—	—
3s	Sulphate of Ammonia— double rate .	4	8	—	3
4	Complete .	16	3	4	4
5	Control . .	4	4	—	3

The observations show that the period of greatest failure lay between December 14 and January 31, so that it coincided with mid-winter. After February 8, there was little increase in the number of failures. The final figures for the trial, taken on March 23, are given in the accompanying table (Table VII).

As in the previous year's trial, it is quite clearly shown that the once-transplanted wallflowers showed little of the disease. In no case was there complete failure of a plant, for usually the " dieback " was confined to one or two side shoots. They were satisfactory plants in every way, of a good green colour and stocky habit.

In the 1937–38 trial, the indication that plants receiving dressings of sulphate of ammonia were particularly prone to this type of failure was not so clearly shown as in the previous season. But it must be remembered that the twice-transplanted plants in each plot had spent two months on highly nitrogenous sweet pea trial ground and

were themselves of soft growth when planted in their permanent quarters. They had already that soft sappy type of growth that the sulphate of ammonia plots were intended to induce and therefore any further effect of manurial treatment was masked.

TABLE VII.

Percentage of plants showing "dieback."

Plot.	Manure.	Variety 'Orange Bedder.'		Variety 'Vulcan.'	
		Once transplanted.	Twice transplanted.	Once transplanted.	Twice transplanted.
1	Sulphate of Potash.	4	73	—	4
2	Superphosphate	24	73	4	4
3	Sulphate of Ammonia	8	43	—	7
3s	Sulphate of Ammonia—double rate	12	56	—	8
4	Complete	12	40	4	7
5	Control	8	36	—	7

Nevertheless, they provided valuable evidence in support of the following conclusions :—

1. That wallflower plants may transplant badly in autumn if a soft sappy type of growth is encouraged in the nursery rows.

2. That if this type of growth is produced at any stage no corrective dressing of potash is of any avail.

3. Wallflower plants of this luxuriant type are not so fitted to stand up to climatic conditions of the winter, particularly severe frost and cold winds.

Supplementary evidence for points 1 and 3 was obtained from observations made on a large planting of wallflowers on the Dahlia ground at Wisley in the past season. The plants were sown in late June and transplanted to nursery rows during August on the sweet pea ground. Owing to late growth retarding lifting of the Dahlias and to the subsequent inclement weather it was not possible to plant these wallflowers out into their permanent quarters until December 1937. The plants established themselves extremely slowly, and the accompanying table (Table VIII) shows the percentage of failures among the different varieties. In passing it is interesting to note that in spite of these extremely unfavourable conditions the variety 'Vulcan' again showed a low percentage of failure. Many of the varieties showed figures similar to those given for the 1935–36 wallflower trial, though 'Feltham Early' showed a far lower figure.

As it was felt that frost might be responsible for a good deal of this damage, another modification was made in the trial to gain evidence on this point. An extra row of 15 plants was added to each plot giving a series of six rows of 'Orange Bedder' and a series of six rows of 'Vulcan' wallflowers. In five plots one row of each variety was protected from severe frost by covering them each night with

TABLE VIII.

Percentage of "dieback" shown by varieties on the Dahlia ground, 1937–38.

Variety.	Percentage.	Variety.	Percentage.
'Cloth of Gold'	21	'Orange Bedder'	23
'Eastern Queen'	7·7	'Primrose Monarch'	8
'Feltham Early'	9	'Rose Queen'	6
'Fire King'	22	'Vulcan'	6
'Giant Ruby'	27	'White Dame'	12·5
'Golden Bedder'	22		

mats supported by wire netting whilst those in the supplementary plots were left as controls. These mats were not completely frost-proof, but would give protection up to 10° of frost. They were removed each morning and put on again at dusk so that as far as possible the plants had as much daylight as the two control rows.

TABLE IX.

Variety.	Unprotected Supplementary Plot.	Protected.				
		Sulphate of Potash.	Superphosphate.	Sulphate of Ammonia.	Complete.	Control.
Orange Bedder	7	9	12	11	8	8
Vulcan	—	3	5	3	1	2

Observations were taken on these plants in which failures were noted on January 18, and by the end of the month a large number of plants were affected as seen in Table IX. For example, out of 15 plants on the superphosphate plot twelve showed "dieback."

It seems that if frost is a pre-disposing factor to the disease it must exceed 10° to be injurious.

CONCLUSIONS.

Since the experimental work has shown that perfectly healthy and even mechanically injured wallflower plants were resistant to attack by Botrytis, it is evident that prior to attack by this fungus

there is some predisposing factor or factors to the disease. It seems that the most important of these are :—

1. Lack of resistance in a variety or strain as shown by the high death-rate in ' Orange Bedder ' as compared with ' Vulcan.'

2. Poor root action as shown by the increased failure in the twice-transplanted plants.

3. Conditions encouraging soft growth as shown by the high percentage failure of plants receiving early or late nitrogenous feeding.

Plants which have to weather the winter handicapped by any of these conditions find it more difficult to withstand unfavourable climatic conditions such as severe frost, cold winds, poor drainage, etc., than well-established hard-grown plants.

When it is desired to establish newly introduced plants in our gardens we try to provide them with conditions as near as possible to their native habitat, but over a period of years we have lost sight of the natural requirements of so common a plant as the wallflower. On ruined walls and buildings conditions are always conducive to hard growth and the production of a well-established root system in the comparatively dry substratum. It is interesting to note in passing that in his Herbal of 1597 GERARD describes the ancestor of our modern wallflower thus " The whole plant is shrubby, of a wooddy substance and can easily endure the cold of winter." It seems likely that in our search for improved varieties and better grown plants we are sacrificing the most valuable character of the plant, *i.e.* the ability to weather the winter unharmed.

If the following points are observed, failure through " dieback " should be reduced to a minimum :—

1. Choose those varieties that show the most resistance to " dieback."

2. Establish the plants in their winter quarters as early in autumn as possible and encourage good root action by good drainage and good cultivation.

3. Avoid soft plants at any stage of growth from nursery bed to permanent quarters.

4. Apply a dressing of sulphate of potash at the rate of 2 ounces to the square yard a fortnight after planting out and again when growth begins in the early spring.

The author's thanks are due to Mr. D. E. GREEN, M.Sc., for his interest and advice throughout the work, and to Mr. N. K. GOULD for the photographs reproduced in figs. 2 and 4.

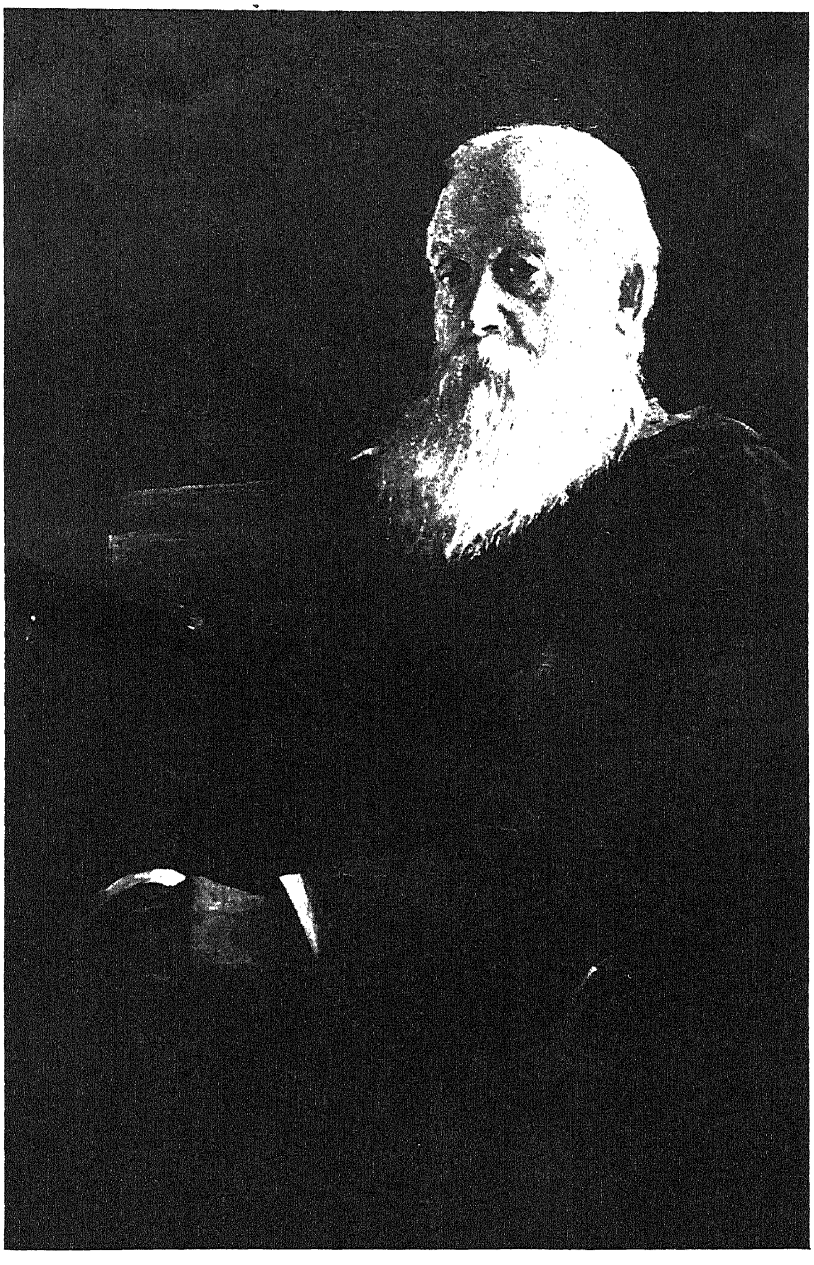


FIG. 152.—THE LATE MR. GEORGE YELD, M.A., V.M.H.
From a portrait in St. Peter's School, York.

[*To face p.* 532.



FIG. 153.—IRIS PUMILA.



FIG. 154.—IRIS CHRYSOGRAPHES.



FIG. 155.—IRIS SIBIRICA.



FIG. 156.—IRIS DOUGLASIANA.

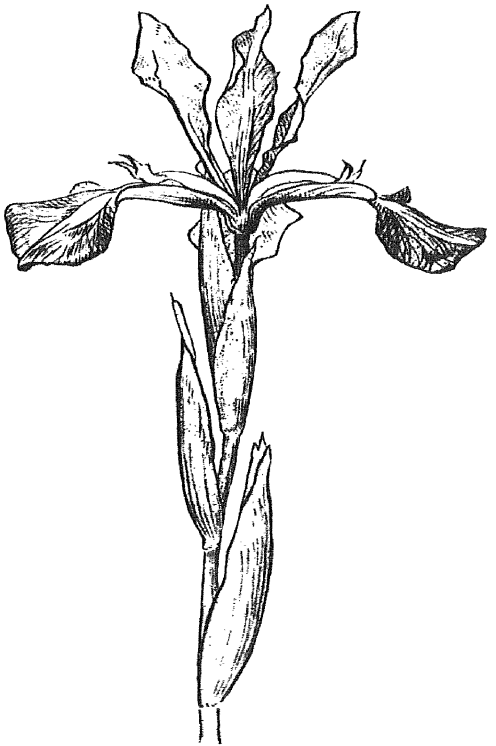


FIG. 157.—IRIS SPURIA.

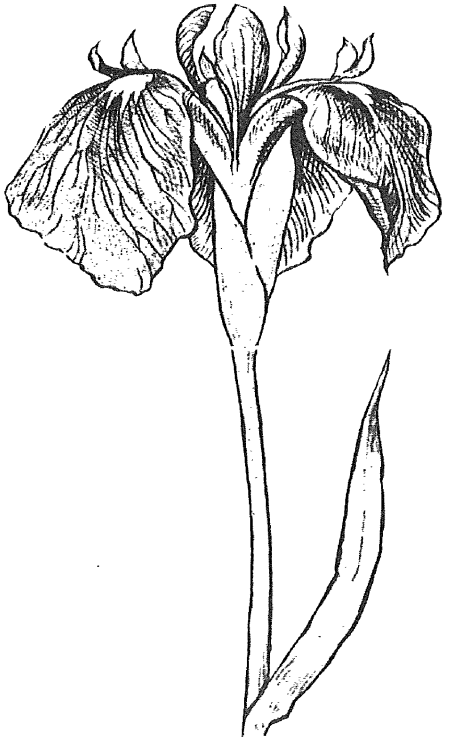


FIG. 158.—IRIS KAEMPFERI.



FIG. 159.—IRIS XIPHIUM.

[*To face p.* 533.

IRISES FOR THE BEGINNER.

By G. P. BAKER, V.M.H.

[Read June 8, 1938; Mr. G. L. PILKINGTON in the Chair.]

MY first acquaintance with Irises was in the early 'eighties when living on Wandsworth Common. I was visited by GEORGE YELD who has recently gone to his rest at the great age of ninety-three years, and to whose memory I would like to pay my tribute of affection. He was a remarkable man, a scholar at Oxford and Newdigate prizeman for English verse. Soon after taking his degree, he went to St. Peter's, York, and remained on the staff for the unprecedented period of fifty-two years and became so closely identified with the school that in the minds of many pupils who passed through his hands, it might have been said that he was the school. But YELD was more than a schoolmaster for, amongst his other activities, he became intensely enthusiastic in horticulture and was one of the first of our amateurs to raise and hybridize Irises and Hemerocallis, adding to the beauty of our gardens many new plants, and for this and other work he was awarded in 1925 the V.M.H. of this Society. He was one of the founders of the Iris Society, and its first President. To him we owe the introduction of 'Lord of June,' 'Asia,' 'Sir Michael,' 'Sarpedon,' 'Camma,' 'Frances,' 'George Yeld,' 'Memory,' 'Neptune,' 'Prospero,' and 'Sunshine,' all to receive the Award of Merit of this Society. He was my oldest and dearest friend. We climbed together in Wales, Skye, the Alps and the Caucasus, and I owe to him more than I can say.

On Mr. YELD'S completion of fifty years of service at St. Peter's, past and present scholars and friends of the school combined and placed in the school a portrait in oils of Mr. YELD, which we reproduce in fig. 152.

I accompanied Mr. YELD to Parker's nursery at Summerstown, near Tooting, and there we each made purchases of Irises, for in those days PARKER was in the front rank for such plants. Of my purchase I still have some of the varieties.

In the garden of the busy man or woman there should be no plants which require undue care or attention. The Iris is just the plant to fill such conditions: it needs little care, is very good-natured, the hardiest and the most accommodating of plants in existence, and gives the largest show for a minimum of labour. It is to be had in a variety of colours from 6*d*. a plant and upwards.

The genus Iris is confined in its wild habitats to the northern hemisphere, and completely encircles the globe, from the Pacific Coast of N. America in the west to China and Japan in the east, and from Alaska, Labrador, Siberia and Kamchatka in the north to Florida and Hong Kong in the south.

Its members are found from the edge of the Arctic regions down to a few degrees north of the equator. In recent years some of its members have been introduced into the southern hemisphere with success. There are varieties that grow in bogs that are perpetually bogs, others that revel in bogs that afterwards become burning wastes; varieties that grow along the edges of the desert; others that grow in countries with marked dry seasons; and a great many that flourish in the temperate zone with average conditions of climate and soil.

It is only natural that a genus of plants of so wide a geographical range and found in such varying climatic conditions must accordingly be very variable in structure. Some are bulbous-rooted whilst others are furnished with rhizomes.

The genus is divided into about a dozen sections, which merge into one another; but to simplify matters I will reduce them to six:

1. *Pogons:* Bearded flags with sword-like foliage.
2. *Apogons:* Beardless flags with rush-like foliage.
3. *Xiphiums:* Bulbous Irises with single stem foliage.
4. *Junos:* Irises with tulip-like foliage and bulbs with fleshy radish-like appendages persistent during the resting season.
5. *Reticulatas:* Irises with awl-like foliage and bulbs with netted coats.
6. *Onco-cycli:* The cushion Irises.

Of these representative groups the first five may be grown without difficulty, but the last group requires special treatment. Their home is Palestine, Syria, Asia Minor and Central Asia. In Palestine some grow at sea level, others below sea level, others at an altitude of 3,000 and 7,000 feet. To grow them satisfactorily one must try to give them conditions they enjoy in their own homes. They represent the goal of the expert Iris grower, and probation must first be served among the humbler and less exacting beauties.

The Pogons, or bearded Irises, represent a large section. DYKES gives twenty-five species, but I will only deal with a few of the familiar ones, whose outer segments bear a beard and whose seeds are characteristic of the section, and thereby help the botanist to determine the section to which they belong.

Taking the dwarf Europeanf orms first, *Iris pumila* (fig. 153) is the smallest of the group. Here is a complete absence of stem, a 2-inch perianth tube, and in winter an absence of foliage of any length. Cultivation is not difficult provided that the position is sunny and well drained and the soil not deficient in lime. A heavy soil suits the plant better than sandy soil, but in any case drainage is essential. The true *I. pumila* is often impossible to find in commerce except varieties called *coerulea, azurea* and *attica*. Some varieties are sweetly scented and smell of heliotrope, while others appear to have no fragrance at all. Every shade of blue, yellow, red, purple seems to occur and the beards also vary in amount of yellow at the base. The one from Macedonia, sent to me from the battle-front in 1916 by one of my sons, is claret colour with a deep blue beard. My Pumilas are very varied and many

were collected by me in very odd places. Some from the Gulf of Corinth, where early one morning at the Piraeus I induced a Greek refugee from Turkey, with his assistant, to row me out to sea and land me on the island of Salamis. Plants we found, and having an interpreter with me, we landed on the mainland, where we were met by a car and so back to the Piraeus, instead of the longer way round by sea. On another occasion on Ahlem Dagh, a hill on the Asiatic side of the Bosphorus, a good number of roots were collected, whilst Hymettus, Parnes, and Olympus have given me many plants. Many years ago when Tirnovo was the capital of Bulgaria, I remember seeing *I. pumila* growing on the roof of a public fountain. I regard this as a lesson that such varieties should be planted on old walls, or on high ground, among and between rocks.

The next I take is *I. Chamaeiris*, a dwarf with a perianth tube twice as long as the ovary and short spathes and stems up to 10 inches. This species has not the wide distribution of *I. pumila* and is to be found in the Maritime Alps in S.E. France and N.W. Italy. It is to be distinguished from the true *I. pumila* by the obvious stem, by the shorter tube and by the more inflated and less membraneous spathes. Another distinguishing mark between *I. pumila* and *I. Chamaeiris* is to be found in the foliage, for the leaves of *I. pumila* do not grow to any length till the winter is over, while *I. Chamaeiris* sends up new leaves early in the autumn and they are therefore several inches in length in winter.

I. Chamaeiris like *I. pumila* is very variable in colour and in dimensions and has received many names. Last year, east of Hyères, in open country amidst broom and on each side of the road, I collected a number of very varied colours.

The next of the group of Pogon Irises for us to consider should be *I. Cengialti* and *I. variegata*, the former from the Lago di Gardo, Monte Baldi, and N.E. shores of the Adriatic, the latter from Austria, Western Hungary and through the Balkan States. Merely saying that both of these wild forms have in hybridizing produced many good garden plants of low stature, we will pass on to the taller forms, *I. pallida* and *I. trojana*, generally known as the June-flowering bearded Irises.

The hardiest and not the least beautiful of them is familiar to everybody as the purple 'Germanica,' a plant which has no more to do with Germany than any other country of Europe. Its origin and home is shrouded in mystery. It was thought by DYKES that Arabia may have been its home, because of pilgrims taking back to their country the germanica *albicans* to be found in Arabia. It was also suggested by DYKES that it may have been a hybrid, possibly a cross of *I. aphylla* and *I. pallida*.

Since the death of Mr. DYKES a German enthusiast worked on this theory and made a communication to the gardening press that he had discovered the cross and produced the plant, but this was refuted by a Frenchman who counted the chromosomes and found they did not correspond with this theory.

I began collecting the common Germanicas from different parts of the Northern hemisphere in the hope that I might throw some light on this problem. I have plants from Turkey, Macedonia, the Pyrenees, The High Atlas, Kirman in Persia, Kashmir, Palestine, and Armenia. They all come into bloom within a few days of the earliest of the hybrids and vary very slightly in colour, the only perceptible difference being in the scent, the one from Kirman in Persia being particularly scented.

The ancients, particularly the Greeks, used the rhizome of the Iris for medicinal purposes. The multiplicity of the ailments for which Iris preparations were prescribed is truly astonishing. Freckles are removed, ulcers cured and filled with flesh: sleep is induced and tears produced: and so on. The rhizome was prepared by being cut into pieces, dried in the shade and then threaded in strings and stored away. Later and in more modern times the Florentine germanica gave the orris root which, having a pleasant scent, has been largely used as a face powder.

Very few of the wild species play any conspicuous part in garden work; they are only to be found in botanical collections; but instead we have hybrids, the work of hybridists of this country, France, Germany and America.

These hybrids are founded on *I. pallida, I. trojana, I. Ricardii* and *I. mesopotamica* wild stock. What a change since Mr. YELD, Sir MICHAEL FOSTER and Sir ARTHUR HORT first introduced their hybrids, to be followed by DYKES and BLISS to name only men of our own country.

Nearly all such hybrids multiply rapidly into clumps and maintain themselves almost indefinitely.

Those who have not taken up this fascinating pursuit of growing Irises will have no difficulty in finding in nurserymen's catalogues long lists of good old sorts at very moderate prices—varieties such as 'Aphrodite,' 'Souvenir de Mme Gaudichau,' 'Asia,' 'Lord of June,' 'Moa,' 'Leonato,' 'Ambassadeur,' to name but a few.

The next step is to do group hybridizing as a hobby, and this is where the fun begins. Pollinating is a very simple operation—all you have to do is to first select a warm dry morning and then with a pair of forceps remove the anther from the Iris flower you are going to pollinate, then collect the pollen from another flower on to a small brush and pass it across the stigma at the base of the crest. Attach a label to the stem of the pollinated flower with the name of the pollen parent.

An interesting incident that is worth recording occurred with rhizomes sent to me by some missionary friends living in Tarsus. I particularly asked them to obtain the Iris rhizomes from the hills, and on no account from any garden. In due course they arrived and were planted, and in the following year they produced flowers which I took to one of the shows. They were very tall, of the *Ricardii* breed. When the show was over I took them home, together with other Iris flowers, and they were placed in a bucket of water in the conservatory. After a few days a seed pod was observed on one of the Tarsus stems: the

stem was nurtured with care, fresh water with a little sugar being added, and after six weeks, or perhaps more, good seed was forthcoming. This was sown and in the third year I was given a very large Plicata now known as Saul of Tarsus. I am inclined to think that pollinating took place before the stem was cut, and development following was not observed.

As to the cultivation, those of you who have a garden on a slope facing south have the ideal location, provision being made for lime rubble, drainage and sunshine being already provided. If, on the other hand, your garden lies low and damp with heavy soil, I recommend planting on mounds: but the ground should be well dug over before planting; do not add manure, but a dressing of superphosphate of lime may be added when planting. Irises are surface-rooting plants, and fertilizers, when necessary, are best given as top-dressings when the plants have grown in the spring.

The proper time for planting is immediately the plants have finished flowering. If this cannot be done, then September–October, by which time the young roots will have grown a few inches. In planting, do not bury the rhizome too deeply: it should only be just covered: plant firmly. It is advisable to divide and transplant bearded Irises every third or fourth year.

I now pass on to the second of the six sections, that of Apogon. This is a very large section comprising fifteen groups of beardless flags with rush-like foliage. I will, however, mention but a few of the better known ones in the Sibirica group. We have the well-known *I. Delavayi*, *I. Wilsonii*, *I. Bulleyana* and *I. chrysographes*, all from Western China; *I. sibirica* and *I. Clarkei* from Darjeeling, and *I. prismatica* along Atlantic coast from Nova Scotia. They are all entirely hardy and of great value to the garden. The plant grows from a slender rhizome which divides, forming compact clumps, producing dense tufts of slender grass-like foliage from 10 inches to several feet in height. Of hybrids in this group, 'Perry's Blue,' 'Heavenly Blue,' YELD'S 'Francis,' are among the best.

In the Californian group there are some very beautiful colour schemes amongst *I. Douglasiana*, *I. tenax*, *I. Purdyi* and *I. macrosiphon*.

Syria also has its group. Very curious and very shy to flower is *I. Grant-Duffii*. Originally given to me by EDWARD WHITTALL, it first flowered with me in the fortieth year. On giving some roots to Mr. STERN it flowers and seeds every year.

The Chinese group includes *I. minuta*, to mention only one, the smallest of all Irises. *I. foetidissima* is a native English Iris—the scarlet-seeded Iris or stinking Iris, from the disagreeable smell emitted by the bruised leaves. It, however, possesses the conspicuous feature that, after its evergreen leaves are formed, the open capsules display their orange-scarlet seeds throughout the winter. These form an ornamental winter decoration.

I. ruthenica is one of this group to stand entirely alone. It has a very wide distribution—in Transylvania and the Altai region and

thence into North China and Corea. A very small sweet-scented Iris of great charm.

I. unguicularis is a very variable species, found in Algeria, Greece, Asia Minor, Syria, Crete and the Greek islands, and generally known as *I. stylosa*. The one from Crete is the smallest of the series, with leaves 5 to 6 inches high. The colour of the standards is deep puce shading to a pale violet and the falls are of the same colours, with an orange line down the midrib. When in Crete in 1926 I came across it in a very odd way. I was on a mule and passing through a forest at an altitude of 3,500 feet, and, not mindful where I was going, I suddenly found myself caught in the branches of an oak tree which just brushed me off the saddle. I fell into what I thought was a tussock of grass but on seeing small Irises, sweetly scented, I soon came to the conclusion that I had at last come across *I. cretensis*. It figures in the Botanical Magazine, t. 9369.

The Spuria group is a large one and includes *I. graminea*, sweet-scented, *I. Sintenisi*, *I. ochroleuca* and *I. aurea*.

I. laevigata with *I. Kaempferi* should be included in the Apogon group. The former is a water Iris from Japan and *I. Kaempferi* grows in bog or ditches.

There is yet one more group I must mention :

I. hexagona, an American one, which gives us *I. fulva*, a copper-coloured flower, and *I. foliosa*, both very beautiful and very desirable plants. DYKES produced a very handsome flower by using the pollen of *I. foliosa* to fertilize *I. fulva*, thereby giving us *I.* × *fulvala*.

There are yet a number of Apogons I could and should mention, but I must desist and get on with the next and third section, the Xiphiums.

In the Xiphium group we have not so many species. It is a group of bulbous Irises with their native homes in Spain and extending well into Morocco. We have first the one known as the Spanish Iris, then a near relative, and a new race known as the Dutch which differ chiefly in somewhat earlier flowering, in size and heavier petal texture.

Then comes *I. xiphioides*, which erroneously came to be called 'English,' a name by which since at least 1576 it has been known. Its home is in the Pyrenees.

I. filifolia and *I. tingitana* must be mentioned, both natives of Morocco. These with Xiphium bulbs should be taken up when the leaves wither and be stored in dry sand for a month or two. Not so those of *I. xiphioides*, where in the mountains they are subject to summer rains.

I will next take the Junos, another of the bulbous groups. The Juno section contains those Irises whose rootstock is a bulb and whose bulbs in their resting state have attached to them several thick fleshy roots, easily broken at their attachment to the bulb. These remain unbranched until the autumn when the rains commence in their native

homes, and then send out many lateral rootlets, forming the support of the plant during the flowering season. Other features characteristic of the members of the group are the deeply channelled or folded leaves (like Tulip leaves) and the small spreading processes that correspond to the standard of other Irises. It is almost paradoxical to call them standards to the flower when they extend as they do horizontally and in some cases actually hang down. As we might expect of plants whose homes are in the drier regions of S. Europe and Asia, all the members of the Juno group need a thorough rest in the summer, and it is because of this absolute rest, not easily provided in our moist climate, that some of the less sturdy species prove difficult to keep. As a general rule, all Juno Irises seem to prefer a stiff soil to one of mere sand, though such vigorous species as *I. bucharica* and *I. orchioides* flourish amazingly in warm well-enriched sand. The most beautiful is *I. Rosenbachiana* from Turkestan, blooming in February and March. Its gorgeous apparel of brilliant colours appears before the leaves. It is best grown under cover.

The next is the Reticulata group, a bulbous Iris (familiar to all gardeners) whose outer tunic to the bulb has a netted coat. The parent bulb produces a few offsets each of considerable size. There are two forms, the larger from the country south of the Caucasus and the smaller from N.W. Persia. In this group we have *I. reticulata* var. 'Cantab,' of pale grey-blue, also a very desirable plant for the garden and not expensive.

I. Winogradowii and *I. Danfordiae* are yellow and belong to this section: the former of recent introduction from Western Caucasus and the latter a native of the Taurus mountains, found growing at an altitude of 4,000 feet. I grow both species in frames.

I. Bakeriana, the smallest, is perhaps the gem of the collection. It hails from mountains in Central Armenia and flowers in January–February. It is very fragrant and perfectly hardy. Bulbs that are doing well may be left undisturbed for years. The characteristic of this species is that its leaves are eight-sided, like the section of an awl, whereas all the other varieties are four-sided.

I. histrio var. *aintabensis* is a variety collected by my brother a few miles from the river Euphrates. It grows and multiplies with me in the open and, in addition to a large increase of bulbils formed in clusters round the base of the parent bulb, it has also produced at the base of the flower stem a good supply of seed capsules.

I. histrio is the last of this section I have to deal with and includes some of the choicest of bulbous Irises. They hail from the Lebanon, the Taurus, and high lands of Asia Minor. In the opening days of a new year *I. histrio* is one of the first flowers to greet one.

I. histrioides, from the hills in Armenia, is a species unto itself, in that the flowers appear before the leaves pierce the soil and is fragrant in a moderately warm room. The seed capsule is half buried at the base of the flowering stem, and unless watched ants will clear them away. Leaves follow the flowering stem.

At the beginning of my talk I referred to the Onco-cyclus Irises as being the most difficult of all Irises to grow with any success, coming as they do from Palestine, Syria, Armenia and Central Asia, and that unless one could treat them under conditions such as they enjoy in their own homes, success would be impossible. I accordingly decided to visit some of these habitats, being accompanied on that occasion by another dear friend, HIATT BAKER, who has gone to his rest. We visited Palestine and Syria and ran to earth the more important of the varieties. A full account appears in the Iris Year Book 1930, to which I refer Fellows who may be interested.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Aeschynanthus speciosa. A.M. September 27, 1938. From B. Ionides, Esq., Buxted Park, Sussex. A very striking Javanese plant suitable for the warm greenhouse. The erect growths reach a height of about 2 feet, and bear fleshy, elliptical-lanceolate, obscurely crenate leaves 3 to 4 inches long and terminal clusters of 10 to 12 large, tubular, orange-scarlet flowers. This species is beautifully figured at t. 4320 of the Botanical Magazine.

***Aster Amellus 'Heinrich Siebert.' A.M.** September 21, 1938. Raised by Messrs. B. Ruys, Royal Moerheim Nurseries, Dedemsvaart, Holland. Plant vigorous, branching, 2 feet tall ; inflorescence branched, closely panicled, free-flowering ; flower heads single, 2½–2¾ inches diameter, rays rose-pink, disc golden-yellow. A distinct variety, useful for cutting.

***Aster Amellus 'Moerheim Gem.' A.M.** September 21, 1938. Sent by Messrs. M. Prichard, Riverslea Nurseries, Christchurch, Hants ; raised by Messrs. B. Ruys. Plant vigorous, branching, 2 feet tall ; inflorescence branched, closely panicled, free-flowering ; flower heads single, 2½ inches diameter, rays bright violet-blue, disc golden-brown. A distinct variety, useful for cutting.

***Aster novi-belgii 'Petunia.' A.M.** September 21, 1938. Sent and raised by Mr. E. Ballard, The Court, Colwall, nr. Malvern. Plant vigorous, branching, 3½ feet tall ; inflorescence branched, closely panicled, free flowering ; flower heads double, some semi-double, 1¼ inch diameter, rays bright petunia-purple, disc yellow. A distinct variety, useful for cutting.

Calluna vulgaris alba flore pleno. A.M. September 13, 1938. From Messrs. Maxwell & Beale, Broadstone. A most desirable, double-flowered white heather of dwarf and compact habit. The erect growths are only 4 or 5 inches high, but carry a large number of closely-set, globular flowers.

Chrysanthemum (Early Flowering) 'Adventure.' A.M. September 20, 1938, as an exhibition variety. Shown by Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire. The plant has good long stems, but with rather large foliage. The flowers are 5½ inches across, deep rich crimson, with a bronze reverse, petals broad, stiff outer reflexing.

Chrysanthemum (Early Flowering) 'Alfreton Beauty.' A.M. September 27, 1938, as an exhibition variety. Raised and shown by Mr. E. Riley. An exhibition variety with rather large foliage and stout stems. The flowers are 5 inches across, of a bright golden-bronze shade with a golden reverse, the petals being broad, stiff, inner incurved, outer reflexing.

* After trial at Wisley.

Chrysanthemum (Early Flowering) 'Ardent.' **A.M.** September 13, 1938, as a show variety. Shown by Messrs J. and T. Johnson, Tibshelf, Derbyshire. Flower stems stiff and stout. Flowers 5 inches across, bright rich crimson, with a golden reverse, petals semi-rolled, inner somewhat incurved.

Chrysanthemum (Early Flowering) 'Dr. George Barnes.' **A.M.** September 20, 1938, as an exhibition variety. Shown by Mr. H. Woolman, Shirley, Birmingham. A variety with long, stiff stems and rather sparse foliage. The flowers are 5 inches across, of a soft creamy-pink shade with a pale biscuit reverse, the petals being stiff, broad and incurving.

Chrysanthemum (Early Flowering) 'Early Marvel.' **A.M.** September 13, 1938, as a show variety. Shown by Messrs. Johnson. The plant has stiff and stout stems of good length which are topped by 5½ inch flowers of a bright rich amber shade; the petals are broad and stiff, somewhat incurved at the centre.

Chrysanthemum (Early Flowering) 'Excelda.' **A.M.** September 20, 1938, as an exhibition variety. Shown by Messrs. Johnson. This variety has long stiff stems and rather large foliage, evenly spaced with flowers fully 6 inches across, of a deep orange-amber shade, and a bright gold reverse; the petals are stiff semi-rolled, the outer reflexing.

Chrysanthemum (Early Flowering) 'Immaculate.' **A.M.** September 20, 1938, as an exhibition variety. Shown by Messrs. Johnson. The plant is of good habit with stiff stems and sparse foliage; flowers fully 6 inches across, clear white, centre pale greenish; petals stiff, long and broad, outer reflexing.

Chrysanthemum (Early Flowering) 'Orpington Gem.' **A.M.** September 20, 1938, as an exhibition variety. Shown by Messrs A. A. Buckwell, Cockmannings Lane Nurseries, St. Mary Cray, Kent. A variety resulting from crossing 'Mrs. Phil Page' with 'Yellow Gem'; it has good stems and foliage. Flowers 5 inches across, bright rich Indian-red with an old gold reverse; petals stiff, semi-rolled, inner erect, outer horizontal.

Chrysanthemum (Early Flowering) 'Spartan.' **A.M.** September 13, 1938, as a show variety. Shown by Messrs. Johnson. A variety with stiff stems and rather longish foliage which is evenly spaced. Flowers 5 inches across, of a rich bronzy-terra-cotta shade with a light bronze reverse; petals stiff, inner incurved, outer reflexed.

Chrysanthemum (Early Flowering) 'Terra-Cotta Freda.' **A.M.** September 20, 1938, as an exhibition variety. Shown by Mr. W. H. Dixson, Horsham Nurseries, Broadbridge Heath, Sussex. A bright terra-cotta flowered form of the well-known variety 'Freda,' which it resembles in every way except in the colour of the flowers.

Chrysanthemum (Early Flowering) 'Tibshelf Glory.' **A.M.** September 13, 1938, as a show variety. Shown by Messrs. Johnson. A variety with stout and stiff stems, foliage rather small. Flowers 5 inches across, bright bronzy-terra-cotta with a light bronze reverse; petals broad, flat, of good substance, inner incurved.

Chrysanthemum (Early Flowering) 'Yellow Wendy.' A.M. September 13, 1938, as a show and market variety. Shown by Messrs. Lambert Bros., Aspley Lane, Aspley, Nottingham. A golden-yellow sport from the well-known variety 'Wendy' which it resembles in every character except colour.

***Fuchsia 'Tom Thumb.' A.M.** August 26, 1938. Introduced and sent by Messrs. Redgrove & Patrick, Seal, Sevenoaks, Kent. A hardy variety, forming a compact globular bush, 1 foot high; very free-flowering. Flowers of medium size, sepals bright rosy-cerise, petals rich purple. Flowering during August and September.

***Heuchera sanguinea 'Corallion.' H.C.** June 23, 1938. Raised and sent by Messrs. C. H. Bloom & Sons, Oakington, Cambs. A free-flowering variety, with flower spikes 2 feet tall; flowers $\frac{3}{8}$ inch diameter, bright coral-rose.

***Heuchera sanguinea 'Freedom.' A.M.** June 23, 1938. Raised and sent by Messrs. C. H. Bloom. A very free-flowering variety with good flower spikes 2 feet tall, freely branched; flowers $\frac{5}{16}$ inch diameter, soft creamy-pink.

***Heuchera sanguinea 'Gaiety.' H.C.** June 23, 1938. Raised and sent by Messrs. C. H. Bloom. Of very free-flowering habit, 28 inches tall; flowers $\frac{3}{8}$ inch diameter, bright rosy-cerise.

***Heuchera sanguinea 'Oakington Jewel.' A.M.** June 23, 1938. Raised and sent by Messrs. C. H. Bloom. A very vigorous variety, $2\frac{1}{2}$ feet tall, free-flowering; flowers $\frac{5}{16}$ inch diameter, bright rosy-red.

***Heuchera sanguinea 'Petworth.' A.M.** June 23, 1938. Introduced and sent by Mr. Ben Wells, The Nurseries, Merstham, Surrey. Plant vigorous, flower spikes 2 feet tall, free-flowering; flowers $\frac{3}{8}$ inch diameter, very bright scarlet.

***Heuchera 'Pink Delight.' A.M.** June 23, 1938. Sent by Messrs. R. H. Bath, The Floral Farms, Wisbech, Cambs. A vigorous variety with flower spikes 2 feet in length, freely produced; flowers $\frac{3}{8}$ inch diameter, soft pink, lobes of the tube deep pink.

Limonium (Statice) asparagoides. A.M. September 6, 1938. From H. D. Ripley, Esq., Horam, E. Sussex. An herbaceous perennial species of Sea Lavender which originates from the maritime regions of Morocco and Algeria. The plant has a woody rootstock with short spatulate basal leaves and gracefully arching grey-green shoots about a foot in length, which are set with short intricately branched subulate side shoots bearing clustered cladodes instead of flowers. Each shoot ends in a loose spray of numerous small rose flowers on short side shoots.

Meconopsis bella. A.M. September 6, 1938. From R. B. Cooke, Esq., Corbridge, Northumberland. The species originates from the district between central Nepal and Bhutan, and has a tufted habit with bright green foliage and delicate light blue flowers of four petals on 3–4 inch stems. The filaments are deep rich blue and the anthers bright yellow.

*Physostegia virginica intermedia rubra. A.M. August 26, 1938. Sent by Mr. Amos Perry, Hardy Plant Nurseries, Enfield, Middlesex. Plant of compact habit; 2½ feet tall; very free flowering. Flower spikes branched, 6 to 12 inches long. Flowers large, bright light rosy-purple, throat white, lined and speckled with rosy-purple. Flowering during August and September.

Podranea Ricasoliana (syn. *Tecoma Mackenii*). A.M. September 27, 1938. From Mrs. H. W. Hall, Lymington. A choice South African climber for the cool house. The dark green, pinnate leaves have usually 7 or 9 entire or sparingly serrate leaflets 1½ inch long. The flowers are 2 inches long and broad, pale blush-pink with purplish rose stripes, and are arranged in large, flattish panicles. An illustration appeared in the JOURNAL, 39, fig. 15 (1913).

Rose 'Orange Nassau.' A.M. September 27, 1938. From Mr. Jan Spek, Boskoop, Holland. A Hybrid Tea variety raised by Messrs. H. A. Verschuren & Sons, Haps, Holland, as the result of a cross between 'Mrs. G. A. van Rossem' and 'Max Krause.' The flowers are sweetly scented and of excellent form. The colour is brilliant deep orange while the reverse of the petals is clear yellow.

*Sweet Pea 'Autocrat.' H.C. June 24, 1938, as a variety for garden decoration. Raised and sent by Mr. Ivan Dickson, Church Farm, Marks Tey, Essex. Flowers large, very freely produced, bright rosy-cerise, on stems 12 to 15 inches long.

*Sweet Pea 'Clarice.' A.M. June 24, 1938. Raised and sent by Messrs. R. Bolton & Son, Birdbrook, Halstead, Essex. Flowers large, in fours, soft pink on a white ground; stems 15 inches long.

*Sweet Pea 'Halo.' A.M. June 24, 1938. Raised and sent by Messrs. R. Bolton. Flowers large, mostly in threes, soft lilac-mauve on a cream ground, on 9- to 12-inch stalks.

*Sweet Pea 'Lady Satin Rose.' A.M. June 24, 1938. Raised and sent by Messrs. Carters' Tested Seeds, Raynes Park, S.W. Flowers large, in threes, a few fours, bright satiny-rose, on 12- to 15-inch stalks.

*Sweet Pea 'Lilac Gown.' A.M. June 24, 1938. Raised and sent by Messrs. Carters' Tested Seeds. Flowers large, in fours, soft lilac-lavender, on 12- to 15-inch stems.

*Sweet Pea 'Marie Rose.' H.C. June 24, 1938. Raised and sent by Messrs. R. Bolton. Flowers large, in fours, bright salmon-rose on a white ground, standards of a darker shade, on 15-inch stalks.

*Sweet Pea 'Maroon King.' A.M. June 24, 1938. Raised and sent by Messrs. R. Bolton & Son. Flowers large, in fours, deep reddish-maroon, on 12- to 15-inch stalks.

*Sweet Pea 'Modesty.' A.M. June 24, 1938. Raised and sent by Messrs. Carters' Tested Seeds. Flowers large, a few with double standards, in fours, soft creamy salmon-pink, on 12- to 15-inch stalks.

*Sweet Pea 'Phyllis.' A.M. June 24, 1938. Raised and sent by

* After trial at Wisley.

Messrs. R. Bolton & Son. Flowers large, mostly in threes, soft creamy-salmon, standards of a darker shade, on 12- to 15-inch stalks.

***Sweet Pea 'Sailor Boy.'** **H.C.** June 24, 1938. Raised and sent by Messrs. E. W. King, Coggeshall, Essex. Flowers large, in threes, very deep violet-blue, on 12- to 15-inch stalks.

***Sweet Pea 'Stella.'** **H.C.** June 24, 1938. Raised and sent by Messrs. R. Bolton. Flowers large, in fours, deep violet-blue, on 15-inch stalks.

* After trial at Wisley.

THE AWARD OF GARDEN MERIT.—XLVI.*

By F. J. CHITTENDEN, F.L.S., V.M.H.

236. SYMPHORICARPUS RACEMOSUS LAEVIGATUS.

Award of Garden Merit, February 2, 1931.

The garden value of *Symphoricarpus racemosus laevigatus* lies in its snow-white fruits. Its pink flowers are small and do not catch the eye; its smooth roundish or lobed leaves are not particularly noticeable, and, except as a screen, the bushy thicket of branches springing from the ground recommend it little. In good soil it may attain to 8 or 10 feet, and the numerous fruits in spikes near the ends of the twigs are so heavy that the leafless branches from which they spring stand in graceful arching curves from autumn until early spring. It is thus a shrub for an out-of-the-way place near the back of the shrub border, and for that is excellent. It is a native of the United States and Canada and was introduced in the early years of the nineteenth century.

237. VIBURNUM HENRYI.

Award of Garden Merit, October 5, 1936.

It is to its beauty at the fruiting time that this evergreen shrub owes its main value, but not to that alone, for it is a distinct looking bush about 10 feet high at maturity, of erect habit, with glabrous, stiff branches, and opposite stalked, narrow, shining leaves about 3 inches long, but sometimes longer, shallowly toothed. The small white flowers appear in June in stiff panicles at the ends of short lateral branches leafy at the base, up to 4 inches long, and the same width at the base. The fruits are about $\frac{1}{3}$ inch long, oval, red in September and October, and later becoming black.

It was named by Dr. HEMSLEY in compliment to its discoverer, Dr. AUGUSTINE HENRY, who found it near Patung in Central China, and was introduced by WILSON, who sent home seed to Messrs. VEITCH in 1901 in whose nursery at Coombe Wood it first fruited. It is quite hardy and not particular as to soil or exposure.

Several species of Viburnum are liable to failure to fruit where one plant only of the species is growing. *V. rhytidophyllum*, another species from Central China, is an example. Whether *V. Henryi* shares this characteristic we are not sure, but it may be well to bear in mind that if two plants are put in they should be separate seedlings. Cuttings of one plant do not serve.

* Notes on plants which have received the Award of Garden Merit have been gathered together and published with the title Some Good Garden Plants. This can be obtained on application to the Secretary, R.H. Society, price 4*s*. Additional notes appeared in the JOURNAL, R.H.S., vol. **63**, pp. 190, 246 and 448.

238. TROLLIUS CHINENSIS.

Award of Garden Merit, October 5, 1936.

The species of Trollius number about twelve and they inhabit moist sub-alpine pastures and copses in the northern hemisphere, usually, however, in drier places than the closely allied Calthas. Like Caltha, Trollius has large yellow sepals, but it differs in possessing also five to twenty narrow petals.

The native *Trollius europaeus* is often called the Globe Flower, as its golden-yellow sepals curve so as to form a globular flower, but not all the species have flowers of this form. In several of them the sepals open more or less flat and the petals stand more or less erect. The flowers of *T. chinensis* are of this form and so are those of *T. Ledebourii* from Eastern Siberia and *T. asiaticus* from north and east Russia, Siberia, Dahuria and China. In all these species the sepals are golden to orange yellow and *T. chinensis* is perhaps the deepest in tone. The characters mainly relied upon to separate them are the number and poise of the sepals and the number and length of the petals in relation to the sepals and stamens. In *T. chinensis* the wide, over-lapping sepals rounded at the apex are usually twelve or thirteen, the petals twenty, somewhat longer than the sepals and over twice the length of the stamens, about $\frac{1}{8}$ in. wide, narrower and pointed, and of the same orange colouring as the sepals.

The plant is a herbaceous perennial reaching about two feet or two feet six inches in height, with palmately divided leaves springing from the stems, flowering in May and June, with flowers between two and three inches across.

It is quite hardy and grows well in moist soil, or even in the bog. It was introduced long since, but grown as a rule under the name of *T. asiaticus*, although named by BUNGE *T. chinensis* many years ago. About 1912, however, W. PURDOM, collecting for Messrs. J. VEITCH sent home seed from China and gave a new impetus to the cultivation of this fine plant, and a new interest in determining the best name for it and defining its characters, which was done by Dr. CRAIB in the Botanical Magazine, t. 8565, where it is well figured.

239. LINUM NARBONENSE.

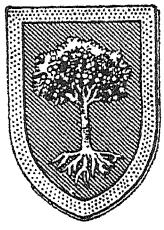
Award of Garden Merit, October 10, 1938.

The genus Linum is rich in blue-flowered species, but perhaps the pick of them for most garden purposes is *Linum narbonense* from the south of France, Spain, Italy and North Africa.

In spite of its southern distribution it is a hardy perennial on well-drained soil. Good drainage it demands, for it is a plant of grassy slopes and hilly meadows, not only on limestone (which so many of the genus affect), where the drainage is sharp. Planted in such places or in a well-drained border it makes a sheaf of wiry stems, branched

near their tops only, bowed gracefully by the weight of their many flowers. The stems are 18 inches to 2 feet high, clothed with narrow bright green leaves, pointed, and rather less than an inch long. The large sky-blue flowers with violet veining are produced almost in umbels and on short stalks at the ends of the branches in June and July. *L. narbonense* is distinguished botanically from related perennial species, *e.g.* the usually taller *L. perenne*, by the club-shaped stigma only slightly thickened at the end, and by the pointed sepals, which, like those of *L. perenne* have no glands, but are obtuse in *L. perenne*. It is somewhat variable in the size of its flowers and the best seedlings should be selected, though nearly all are good. A white-flowered form is sometimes seen.

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FORTHCOMING EVENTS.

WITH the issue of this JOURNAL the year draws to an end. Our gardens have had much to put up with in the vagaries of our climate. The early part of the year played havoc with our gardens, but when all is said and done they have on the whole flourished and have produced not only most of what has been required of them but also a great number of new and interesting plants which have appeared at the Society's fortnightly meetings.

The closing events in the Calendar include a demonstration on the Pruning of Fruit Trees which will be given at Wisley (weather permitting) on December 7 and 8 (2 to 4 P.M.). Fellows wishing to attend this demonstration should notify the Director of the Gardens beforehand.

On December 13 (12 noon to 5 P.M.) a Fortnightly Show will be held in the New Hall.

The first show of the New Year will be held on January 10 (12 noon to 5 P.M.).

At 3.30 P.M. on January 10, in the Lecture Room of the New Hall, a lecture will be given on "Landscape Design in Memorial Gardens," by Mr. EDWARD WHITE, V.M.H. This lecture will be given under the auspices of the Institute of Landscape Architects, but Fellows of the Society are invited to attend.

On January 24 (12 noon to 5 P.M.) a Fortnightly Show will be held. On this occasion a special exhibit from Wisley on the Winter Stages of Pests and Diseases of Fruits and Other Plants will be staged.

A lecture on "Dahlias" will be given by Mr. A. J. COBB at 3.30 P.M. on January 24.

With the coming of the New Year there are three things to call to

mind : first, all annual subscriptions are payable in advance on January 1 of each year ; Fellows can relieve themselves of trouble by payment of a lump sum for Life Fellowship, or by obtaining from the Secretary a Banker's Order instructing their bankers to pay their subscriptions on January 1 each year ; secondly, all changes of address or changes in bankers through whom subscriptions are paid should be notified to the Secretary as soon as possible ; and, thirdly, a list of seeds and plants for distribution in 1939, together with a form of application, will be distributed in the January JOURNAL. Should such lists and forms not be found in that JOURNAL, the Secretary asks that he may be notified at once.

COMPETITIONS FOR 1939.

A programme of competitions for amateur gardeners has been arranged for 1939 on similar lines to those held this year, and for the convenience of those taking an interest in such competitions the list, together with the dates, will be found on the Fellows' tickets for 1939. This list will also serve as a guide to those visiting the shows as to what is likely to be a prominent feature of the show in question.

The first competition in 1939 will be held on January 10, when a silver trophy, presented by the Orchid Trade, will be offered for award for the best twenty-five Cypripedium plants, species and/or hybrids, shown by an amateur. Entries must be made on special forms obtainable from the Secretary, by whom the completed forms must be received not later than by the first post on Wednesday, January 4.

PICTURES, PLANS, PHOTOGRAPHS, ETC.

Pictures and photographs of plants, flowers, gardens, and plans or models of gardens, may be shown on January 10 and 24 and February 7, and the regulations with regard to these exhibits may be had on application to the Secretary.

HORTICULTURAL SUNDRIES.

Sundries of a distinctly horticultural nature may be shown at the Fortnightly Shows on January 10 and 24, if space is available.

HORTICULTURAL EXAMINATIONS.

Intending candidates for the Society's 1939 examinations are reminded that the syllabus, giving the dates for next year's examinations and entry forms, may now be obtained from the Society's Offices.

PUBLICATIONS.

Attention is specially drawn to the following recent publications of the Society at this time of the year when they should make seasonable gifts.

The Daffodil Year-Book, 1938, and the Lily Year-Book, 1938, may be obtained upon application to the Secretary, price 5s. in limp cover, and 6s. in stiff cover.

"Some Good Garden Plants," being those plants that have received the Award of Garden Merit, can be obtained, price 4s., in limp cover.

The report of the Conference on Flowering Trees and Shrubs held in April, "Ornamental Flowering Trees and Shrubs," is available, bound, to Fellows at 7s. 6d. post free, and to non-Fellows at 10s. 6d. post free.

The R.H.S. Diary is obtainable at 2s. 2d. post free in Pluviusin with back loop and pencil; 3s. 8d. post free in Morocco leather (not refillable), with pencil; or 5s. 2d. post free in refillable Crocodile Case with card and stamp pockets.

Catalogues.

Fellows are again reminded that the Society maintains in the Lindley Library a collection of catalogues, not only of the past but also of the present, and the Librarian would be grateful if Fellows when turning over their accumulation of catalogues would think of the Library and forward any that they do not want to the Secretary.

Catalogues of the past are often useful in providing evidence of the introduction of new plants or even the date of the raising of a new variety.

Hall Lettings.

On December 7 and 8 in the New Hall a "Merry Market" will be held in aid of the Great Ormond Street Hospital for Sick Children. Inquiries should be addressed to the Hon. Margaret Bigge, 25 Connaught Square, London, W. 2.

The National Show of Cage Birds will be held in the New Hall on January 19, 20 and 21. For further particulars apply to S. A. Legg, Esq., Secretary and Show Manager, Crystal Palace, S.E. 19.

Wisley in December.

Even in the last month of the year those who come to Wisley will find something of interest, including perhaps the new planting of the Rhododendron trials on the north slope of Battleston Hill, above the Dahlia trial ground. If flowers are few out-of-doors, then they will be found within the shelter of the glass-houses; in the second house are several varieties of *Primula obconica* on trial, and in the Temperate house such beautiful and useful shrubs for this dull season as Acacia species, *Epacris ardentissima* with long spires of rose-red Heath-like blooms, the South African *Erica canaliculata* smothered with tiny white or pink-tinted cups, *Lapageria rosea* climbing on the supports of the house and hanging therefrom its waxy rose-pink trumpets, and the lovely *Luculia gratissima* from the Himalaya with heads of delicate pink blossoms.

The Heath garden is not without colour, for now the many varieties of *Erica carnea* begin a long season of flowering, of which the deep rose *praecox rubra* and 'King George' are among the earliest. In a neighbouring shrub border grows the winter-blooming *Prunus subhirtella autumnalis*, which may produce its semi-double, very pale pink flowers at any time between November and April, but usually at the two seasons of November–December and March. Other shrubs hereabouts are the Barberries, Pyracanthas and Cotoneasters, notable by reason of their brightly coloured fruits; of the Cotoneasters, *Cotoneaster lactea*, *C. turbinata*, and *C. serotina* are three of the latest in colouring their berries, and therefore especially useful in gardens.

Beside the pond the richly coloured stems of the Dogwoods (*Cornus* species), the Willows (*Salix vitellina britzensis* and *S. vitellina pendula*), and certain Berberis species (e.g. *Berberis yunnanensis*) glow in the sunshine, and another family of value in winter for their white-barked stems are the Birches, especially the North American Paper Birch, *Betula papyrifera*, as well as our own native *B. verrucosa*, and *B. mandshurica* from north-eastern Asia.

In the Wild Garden and Award of Merit Garden *Viburnum fragrans* will no doubt continue to produce its sweetly scented pale pink clusters of blossom as long as the weather is favourable, and under the south wall of the Laboratory can be found the rich mauve flowers of the Algerian *Iris unguicularis*, an invaluable plant for house decoration.



FIG. 160.—MIDDLE WALK, HOWARD'S FIELD, WISLEY, WITH BORDER OF HELIANTHEMUM.

[*To face p.* 552.



FIG. 161.—RHODODENDRON × KEWENSE AND AZALEAS AT WISLEY.

THIRTY YEARS AN EXHIBITOR: ADVICE TO YOUNG EXHIBITORS.

By A. E. USHER, F.R.H.S.

[Read October 11, 1938; Mr. C. H. CURTIS, F.L.S., V.M.H., in the Chair.]

WHEN I was about nineteen years of age I came to London to see the National Chrysanthemum Society's Show, held at that time in the old Aquarium. For several years I had read in the horticultural press the reports of this and other shows, and I knew that there were three great growers who always exhibited at this show, and I went into the hall as much interested to see which of these three great men had won as I was to see their flowers.

Flower shows are like shop windows: the best classes are usually put nearest the entrance, and as one entered the St. Stephen's Hall the first thing to catch the eye was what was called the "Great Vase Class." This class was for thirty-six Japanese blooms in twelve varieties, three of one variety in each vase. To my novice eye there was one set of flowers much better than any of the others, and of course I made straight for those blooms to see which of the three great men had outdistanced the others by such a large margin. To my great astonishment that First Prize card did not bear the name of any one of those men, but that of a man I had not heard of before, F. S. VALLIS, and while I stood admiring those blooms, two of the great growers of former years were congratulating a lad who did not look much more than a schoolboy; but that lad had, that day, staged blooms much better than any that had ever been seen before, as he did for several years afterwards all over England. Little did I think that in years to come I should have the great pleasure of being a colleague of the lad as a judge at many shows, and that he would judge hundreds, I might say thousands, of my own blooms.

That day meant much to me. If that lad could do it, I could also try, and although it was some years before I had the opportunity of exhibiting, from that day my mind was made up that I would some day grow flowers for the exhibition table.

At this time I was a journeyman under Mr. F. TOWNESEND at Chislehurst, Kent, and later under Mr. T. LAST in the same district. I was a regular attendant at the meetings of the Chislehurst Gardeners' Association, whose Chairman at this time was that great gardener Mr. J. LYNE. I have always considered that Mr. LYNE was the greatest friend to young gardeners I have ever known, and many a kindness he did me, although I never worked under him. Although I left the district before I was twenty-one, words I heard Mr. LYNE

use have been repeated by me at many gardeners' meetings, and I hope they have done as much good to many young gardeners as they did to me.

In 1905 I was appointed head gardener to Sir RANDOLF BAKER, who was of my own age, and I soon discovered that he was very keen on the Perpetual-flowering Carnations, then in their infancy. Practically every variety that came into commerce was tried in these gardens, and during the last thirty-three years we must have tried hundreds of novelties. I consider the greatest varieties I have ever grown were 'Pink Delight' and 'Laddie.' 'Pink Delight' soon deteriorated, although we do sometimes see good blooms of it to-day. 'Laddie' has had a long life, but it seems to be deteriorating fast now, and I have not found a variety to take its place. It has given us two or three very good sports, but these, like their parent now, do not seem to have the same freedom of growth which 'Laddie' had ten years ago.

When I came up to London to my first Carnation Show as an exhibitor, the show was held in the Royal Botanic Gardens; the Society was then known as the "Winter Flowering Carnation Society." At that time there was much writing in the horticultural press about flowering Malmaisons in the winter, but it was soon discovered that the amount of bloom that those plants gave during the winter was very small. Although a group of them was awarded a Gold Medal that day, it was the only group of Malmaisons I have ever seen during the winter months. The varieties of Carnations mostly exhibited that day were 'Enchantress' and its sports, 'Robert Craig' and 'Britannia.' All of these varieties were, of course, superseded long ago. I consider greater improvement has been made in the Perpetual-flowering Carnation during the last thirty-five years than in any other flower, excepting perhaps the Dahlia. I well recollect unpacking the first plants of 'Mrs. T. Lawson' and 'Enchantress' that were received in Sir WILLIAM MARRIOTT'S gardens at Down House, Blandford, where I was foreman thirty-eight years ago, and it was about this time when these varieties were first introduced.

Sir RANDOLF also became keenly interested in Sweet Peas and Chrysanthemums, and as large quantities of flowers were required here in the autumn months, we soon worked up one of the best collections of Chrysanthemums there were in the country, and in 1906 I started exhibiting them. My first show was at Bournemouth, which at that time held one of the best Autumn Shows in the provinces. The advice and help I received at that show did me much good, and, also, I had the good fortune to win my first Silver Cup for Chrysanthemums. Bournemouth, like most other shows at this time, was made up almost entirely of competitive exhibits from private gardens. How different things are to-day!

Before passing from Chrysanthemums, I will mention a few of the greatest Japanese varieties I have known. In my early days the varieties 'Madame Carnot,' 'F. S. Vallis,' 'Mons. Chenon de Leche,'

'Mrs. H. Weeks,' 'Australia,' 'Edith Tabor,' and the 'G. W. Payne' family were among the best, and I very much doubt whether we have any better varieties to-day than 'Madame Carnot,' 'F. S. Vallis,' etc., as they used to be staged by Mr. VALLIS nearly forty years ago. In later years the best varieties have undoubtedly been 'Mrs. G. Drabble,' 'Mrs. W. Rigby,' 'Majestic' and its sports, 'Mrs. A. Davis' and its sports, 'Victory,' 'Queen,' and 'Princess Mary.'

In my early days, Singles and Decoratives as we see them to-day were unknown. I consider the late Mr. W. J. GODFREY of Exmouth the greatest raiser of Singles the world has ever known. It must be nearly twenty years since he gave up business, but varieties which he raised, such as the 'Molly Godfrey' family, 'Mrs. W. J. Godfrey,' 'Reginald Godfrey,' and many others, are still among the very best; and among Decoratives his variety 'Favourite' has given us so many sports that I think everyone will agree that it has proved itself to be the greatest Chrysanthemum ever raised, and it is grown in millions to-day.

In 1907 I started exhibiting Sweet Peas in London. Previous to the show I had read in the press that the flowers should be cut and put in water for a few hours, and then have tissue paper wrapped round their stems and be packed in flat boxes. I took this to mean that tissue paper should be wrapped round each stem separately. Hence the flowers were cut and placed in water, and with the help of several volunteers every stem was wrapped in tissue paper, and the flowers laid in boxes. I need hardly say that this was a long process, not only to wrap them, but also to unwrap them after arrival at the show before they could be put into water.

Of course I soon discovered my mistake. The writer of the article I had read had intended that each *bunch* should have tissue paper wrapped round the stems. I had a fairly successful show, and when I left the hall before the judging I thought I had a good chance of winning the Sutton Cup (the "Audit Class" as it was then called), but on my return to the hall I found my exhibit in this class marked "Not according to Schedule." Eighteen of the varieties named in the classification list had to be staged in this class, and in that list was a variety named 'John Ingman.' The firm of seedsmen from whom I had purchased most of my seed that year had sent out a plain standard variety named 'John Ingman.' Being a novice, I did not know then that 'John Ingman' should be one of the new Spencer varieties, as they were then called. Of course the judges disqualified my exhibit, but I won the class the following year, as I did on about twelve occasions afterwards.

My experiences with Sweet Peas since that time have been many. At many shows in those days one had to work all night, staging by the light of candles. The exhibits which, for several years, we staged at the Holland House Show had to be done in this way. Five years I tried to obtain the award of an R.H.S. Gold Medal, but on each occasion was awarded a Silver Cup. However, I would not give up,

and the next year was successful in obtaining the former award, and again the following year.

I had one very annoying experience with Sweet Peas some years ago. I cut the flowers perfectly dry and treated them exactly as I had treated them for shows all over England, and, although they only had to travel to London, when the boxes were unpacked the flowers were all in a sweat and many of them had decayed. The flowers had been packed in the boxes only for about six hours. I blamed this on some manure that had been given to the plants about ten days before the show, for, after I returned home from the show, I experimented with some flowers and found for several days that after the flowers had been in water an hour or two they were quite moist and the stems wet far above the water in the jars, but after about another ten days they were perfectly all right again. This was the only lot of Sweet Peas I ever had travel really badly. I have had this experience with Chrysanthemums two or three times, the water seeming to creep up the stems as they stand in tubes in the boxes. This happened as recently as last year. The blooms I took to Plymouth, when taken out of the boxes, were beginning to show tiny spots, the freshness had gone out of them, and by the third day many of them were completely decayed.

Only those who have had several years' experience in growing Sweet Peas for exhibition know what effect the weather has upon them, and only those who have some knowledge of chemicals, and how they affect certain plants in different kinds of weather, will succeed with them for many years in succession.

Sweet Peas have undoubtedly been improved during the last thirty years, but I think that by far the greatest improvement was made during the years from 1907 to 1914. I do not consider I have seen better Sweet Peas than those that were staged in 1909 and 1910. I would place 'R. F. Felton' as the best variety I have ever grown, and we have no varieties to-day to take the places of those great sorts, 'Barbara,' 'Charles Foster,' and 'Afterglow.' The best white we have had was 'Constance Hinton.' Most varieties of Sweet Peas deteriorate very quickly, and very few of them last for ten years. 'R. F. Felton' stood the test longer than any variety I have known. Some raisers may say the reason they seem to deteriorate is that much better varieties are being raised, but thirty years ago I remember measuring Sweet Peas 2¾ inches across the standard, and if they had been continually improved what size would this be now?

The most worrying time I ever had was during the two days preceding the International Show in 1912. I had entered in a Group of Carnation Plants, a class for Cut Carnations, and two classes for Sweet Peas, the Carnation Group being open to all. The plants for this group were all prepared and packed in a large pantechnicon van, all the appliances required for staging, ferns, etc., being packed under the Carnations by means of shelves. My foreman left for London, as I had arranged with the Railway Company to deliver the

van to Chelsea. My intention was to cut the Carnations and Sweet Peas required for the other classes after the van had left on its eleven miles journey to Semley station with horses, and to retire to bed early, as I had to be up at daylight to pack the flowers and proceed to London. However, at about nine o'clock that evening I received a telegram from the station-master at Semley saying, " Your van is two inches too high and you cannot send it." I managed to collect some men and went to Semley station. Here we obtained two railway trucks and everything was unloaded from the van and packed into these trucks. I asked the station-master to wire Waterloo to request them not to touch the plants until I arrived there, as there was no way of contacting my men in London. But on my arrival at Waterloo most of the plants were already loaded on to three railway vans by the porters under the supervision of the inspector of the department. My heart sank as I thought that was the end of my hopes of being awarded a Gold Medal for Carnations. However, on arrival at Chelsea, we found but one bloom damaged. That railway inspector became a great friend of mine until he passed away. But my worries were not over yet. At about six o'clock in the morning I thought we had just about finished staging. We had arranged the Carnations in several groups with the best plants as dot plants. In each of these groups we had a fine Cocos Palm. The late Mr. W. H. PAGE came to me and said, " You are winning that class easily, but if you leave those palms there you might get disqualified." You can guess my feelings, but Mr. PAGE was a man many years my senior and at once I took his advice, the palms being removed and the staging completed just in time for the judging. A few hours afterwards all our work and worries were rewarded with two large Gold Medals, a Silver Cup, a Silver-gilt Medal and four First Prizes.

I have confined this lecture so far to the three flowers with which I have done by far the greater part of my exhibiting. It was not until 1926 that I started exhibiting fruit and vegetables on a large scale, although previously I had exhibited them at many shows where Sweet Peas or Chrysanthemums had been my chief subject. If only for the reason that it brought me many fresh friends I am very glad I did; it was the means of my becoming a great friend of the late EDWIN BECKETT during the latter years of his life, and of meeting most of our great fruit and vegetable growers. There is no friendship I enjoy more than that of such men as JOHN JONES, and I would like to say a few words about this great man. He was a miner and he used to grow vegetables in his spare time for exhibitions. Later he started a nursery, which to-day is a flourishing business, and I consider him to be one of the greatest vegetable growers in the British Isles. Many times I have looked at his collections of vegetables with admiration, for I am convinced that perfect vegetables such as are exhibited by him are the hardest of all horticultural produce to grow.

Any successes I may have had recently with fruit and vegetables are well known to you all, and I intend to say but little about them,

but I do advise more young gardeners to take up the growing of exhibition vegetables. It may be hard work, and there will be many disappointments, but the pleasure of seeing a perfect collection of vegetables produced by oneself amply repays all the work and worry.

I will now endeavour to give a few hints to all of those who are thinking of becoming exhibitors, and in particular to the young gardeners. Remember first of all that it is your primary job to grow produce for your employer, and you should see that he gains by your exhibiting by having better produce than he could possibly otherwise obtain. This should be the case, as exhibiting will bring you into contact with all the best growers in the country, and you will learn much at the shows that should be to your good. If you are to become an exhibitor of repute you must make your work your hobby, you must love your garden, and while specializing in the subjects you are growing for exhibition, no other part of the garden must suffer. Your employer will also gain in another way, as you will be able to get keen young men. I have always found that young men are much keener and will do better work in a garden where things are grown well.

First of all find out what your employer is most interested in, and then do your best to grow this, whatever it may be, to the very best of your ability. When you have grown this really well, then is the time to suggest exhibiting.

For instance, supposing your employer is very keen on good fruit. This cannot be produced in one year; but by careful selection of varieties and good cultivation in a few years you should be able to produce fruit good enough for exhibition; and in my opinion if, after you have been in a garden three or four years, you have no fruit good enough for the show bench, then you have not any that will make a good name for you at the dining table—and every young gardener should remember that it is at the dining table where his skill is most noticed with fruit and vegetables.

Maybe your employer is very interested in some kind of flower. If so, work up a good stock of this subject as quickly as possible. A good stock of Chrysanthemums, Carnations, Dahlias, Sweet Peas, Roses and many other flowers can be obtained very quickly. Do not attempt to grow too many varieties, but obtain those which are considered to be the best.

Now I want to address my advice to all. Whether you are an amateur or a cottager, there is no reason why you should not one day become an exhibitor of repute. Once I asked one of the greatest growers in this country to what he owed his success, and his answer to me was: "When I started I had nothing to unlearn." I have already mentioned that JOHN JONES was a miner, but, through starting to exhibit in a small way, he has built up a very successful nursery and has become one of the best vegetable growers in the country. I could mention many other such cases, where men with no experience, no capital, but through being keen exhibitors in a

small way, have become either well-known nurserymen or exhibitors of great repute.

I ask every young man when he admires the best flowers, fruit or vegetables at the shows to think to himself: "If others can do it, so can I." If you do not succeed at the first attempt, make a very close inspection of the exhibits which have beaten yours and then go home with your mind made up to do better the next time. I know one young man who did this for some years, and to-day he holds one of the best posts in horticulture.

Let us suppose you are thinking of becoming an exhibitor of some particular kind of flower. I would advise you to visit several shows where you know this flower will be staged well grown. Make a list of the names of the best varieties, obtain all the advice you can from the leading exhibitors—and do not go away thinking it is no use asking their advice because they probably would not tell you anything of any value. Gardeners are not made that way. Once again, let me say, do not grow too many varieties, but grow as many as you can of each variety. With Sweet Peas, if you require twelve varieties, then grow fourteen; with Dahlias, if you require six, then grow eight, and so on. With Japanese Chrysanthemums, however, you will probably do better to grow more extra varieties, as one can never be sure of getting any particular varieties of them in any one year on the date required. There are on the market now five varieties of 'Majestics,' and four varieties of the 'Carpenter' family. If these should fail you, then nine varieties are gone, but if you have all or some of them good, they will help you to win the first prize.

If, however, you are going to grow fruit for exhibition and have to make a start, you must be prepared to wait several years before exhibiting. When planting trees, plant only the best varieties, and make a hobby of your trees from the day they are planted.

If you are hoping to become a great exhibitor of vegetables, you must be prepared for much hard work, and probably also for many disappointments. So many subjects are growing underground and one cannot see what they are like until one has to get them for the show. Many times I have tried one or two Carrots, or maybe Beetroots, and they have been really good, but when I have gone to get half a dozen or more for a show, there have often been great disappointments. It is probably the most interesting of all exhibiting, but to grow and stage good vegetables one must never rely on any one bed of such things as Carrots, Beetroots, etc., and rows of Peas, Beans, and so on, should be grown in several parts of the garden.

I would advise anyone desiring to grow any plant really well to gain some knowledge of manures and to experiment with them, the aim being to find out what effect they have on a plant in different kinds of weather. This should be a part of every young gardener's training, and it is something which can be obtained quite easily. Experiments should also be made to determine when is the best time to cut any particular kind of flower, especially if they have to travel

long journeys. Dahlias should be cut very early in the morning, for instance. Sweet Peas, and most other flowers in fact, should have several hours in water before packing. All flowers travel best if they can be cut and packed when dry.

In preparing vegetables for exhibition, always leave Parsnips to the last of all the root vegetables. Another very important item is to see that you have sufficient boxes, etc., for packing. If you have a considerable quantity of produce to prepare and pack, it is advisable to work out a time-table, always keeping on the right side of the clock. This also applies to staging. It is much better to have an hour or two to spare, than to have to rush things at the last moment. Always take some spare flowers or extra dishes of fruit or vegetables as the case may be, in case of accidents. Obviously, it is better to have too many than to be short.

Before leaving your exhibits prior to the judging, make certain that every vase or dish is properly labelled with the name of the variety, and also be sure you have the right number of varieties and the right number of each variety in each dish or vase.

If you start exhibiting, and if you really love your garden, you will never regret it and you will find many friends among the leading growers in the country.

Before I sit down, I ask all great growers of the day to remember that we come and we go. Let us all do all we can to help the young men, so that they are able to start a few rounds higher up that high ladder of horticulture than we did ourselves.



FIG. 162.—EFFECT OF POTASSIUM PERMANGANATE ON LETTUCE.
A, Control; B, Weak solution applied.



FIG. 163.—EFFECT OF POTASSIUM PERMANGANATE ON TOMATO.
From left—Weak solution, weekly; Control; Strong solution weekly.

[*To face p.* 561.

THE OXIDATION OF SOIL HUMUS: FURTHER TRIALS WITH POTASSIUM PERMANGANATE.

By C. B. GREENING, B.Sc. (Agric.).

IN the September 1936 issue of this JOURNAL the writer gave details of the preliminary results obtained by the application of potassium permanganate to garden soils and outlined the nature of further trials then in progress at Wisley. These trials have confirmed the practical utility of this new soil treatment.

The Decomposition of Organic Matter.—In the first article emphasis was laid upon the fundamental importance of the part played by decomposing organic material in the promotion of soil fertility. It was pointed out that the essential feature of the investigation was to determine whether or not the property of potassium permanganate to decompose organic matter could be used to practical advantage in horticulture. It was thought that such decomposition could be brought about in the heap as well as in the soil itself.

Accordingly, on July 23, 1936, a heap consisting of 1 cubic yard of mixed garden refuse was soaked with 6 gallons of a solution containing 3 oz. of permanganate. The heap was lightly covered with sifted soil. On August 21 the heap was turned with a fork and treated with 3 oz. of permanganate dissolved in 3 gallons of water. Two further treatments, each consisting of 2 gallons of solution containing 2 oz. of permanganate, were given on August 26 and September 1. Before each application the heap was turned.

Decomposition set in rapidly during the middle of August, and a month later the heap was ready for use as organic manure. Considerable reduction in bulk of the heap had taken place.

A " control " heap consisting of 1 cubic yard of similar refuse was treated on the same dates with the same quantities of water as contained by the permanganate solutions. It was clearly evident, after the first fortnight, that the treated heap was decomposing far more rapidly than the " control."

The use of crystals of permanganate was investigated in a third heap consisting of the same bulk of refuse. The crystals were sprinkled throughout the heap and water was applied in the same quantities as used in the solutions and on the same dates. Although decomposition proceeded more rapidly than in the " control " heap, the use of crystals was not found to be as effective as that of solutions.

The success of this treatment of garden refuse in the heap with potassium permanganate is important on two scores. From a practical standpoint, the gardener is provided with a simple means of preparing good organic manure in a short time. Secondly, from a scientific point of view, further evidence is provided of the probable

nature of the soil action of permanganate, which is discussed later in this article.

The Use of Permanganate on Lawns.—The further trials carried out with permanganate on lawns at Wisley confirm the effectiveness of its use for the following purposes :—

1. The stimulation of growth of grass.
2. The eradication of moss.
3. The destruction of " mat."
4. The control of earthworms.

The treatment of lawns with permanganate is unique in that all of these effects can be produced in one operation. The treatment can, however, be modified to deal specially with each requirement, which will therefore be considered separately.

1. *The Stimulation of Growth of Grass.*

The manurial benefit resulting from an application of permanganate to a lawn is quickly seen. More vigorous growth of darker green grass is usually noticeable, in comparison with " control," within a week of the time of application. The rate of application can be varied considerably to meet differing soil conditions. Generally speaking, heavy loams and clays appear to respond to light dressings more readily than do the lighter types of soil. On heavy soils, the application of ¼ oz. of permanganate dissolved in 2 gallons of water applied to 3 square yards is frequently effective ; but on lighter soils it may be necessary to use as much as 1 oz. of permanganate dissolved in 1 gallon of water to the square yard.

A particularly interesting result emerged from two Latin squares laid down on the lawn behind the herbaceous border at Wisley in 1936. One set of plots showed definite manurial benefit from the application of permanganate, whilst, in the other, a negative result was obtained. In the first, the plots were laid down on old turf, whilst the second set of plots consisted of new grass. The lack of organic matter in the second was thought to provide the explanation for the absence of manurial effect. The treatment in each case consisted of three separate applications of permanganate at 2–3 weeks intervals, at the rate of ¼ oz. dissolved in 2 gallons of water applied to 3 square yards.

2. *The Eradication of Moss.*

The need for a simple means of eradicating moss has been felt for a long time.

The tests which have been carried out at Wisley not only show that permanganate will kill moss, but that this treatment creates soil conditions unfavourable to its growth. The moss is killed as a result of the direct absorption of permanganate into its tissues, whilst the

aeration of the soil caused by the application improves surface drainage and thereby discourages the development of moss.

Moss present in a lawn is not, however, invariably eradicated by a single application of permanganate. If the use of a dilute solution has not proved successful, the rate of application may be increased up to 1 oz. of permanganate dissolved in 1 gallon of water applied to the square yard. The treatment should be given under dry conditions immediately after the lawn has been cut. In these circumstances, the moss absorbs the permanganate more readily, whilst the cutting of the lawn results in many of the growing tips of the moss plants—which are frequently resistant to this treatment—being removed. In cases calling for drastic treatment, two strong applications of permanganate may be given at an interval of a fortnight.

3. *The Destruction of "Mat."*

At Wisley, the use of permanganate within the rates of application already mentioned has proved successful in eliminating matted growth on the lawn surface. Badly "matted" lawns, of course, require the use of strong solutions.

Soon after the application has been given, it will be seen that the turf has been thoroughly "cleaned up" and generally rejuvenated.

4. *The Control of Earthworms.*

Tests carried out at Wisley have shown that permanganate can be successfully used for the control of earthworms during either spring or autumn months. Application should be made at rates between ½ oz. and 1 oz. of permanganate dissolved in 1 gallon of water to 1 square yard. More dilute solutions may be used, however, in cases where only mild treatment is desirable.

Whilst the effects of permanganate in worm-killing are not as drastic as those of some substances sold specifically for this purpose, its use has something to recommend it. The treatment is simple and safe, and brings all-round benefit to the lawn.

Earthworms come to the surface immediately after the permanganate is applied. When strong solutions are used many of the worms die, but they should always be brushed up and thrown away.

The Effect of Permanganate on Plant Growth.—In 1931, private garden trials carried out by the writer showed a stimulation in the growth of radishes, lettuce plants and red-currants treated with permanganate. Last season, similar manurial benefit was observed from the treatment of lawns at Wisley.

In these circumstances, it was decided to test at Wisley the effects of permanganate on plant growth by a series of pot experiments. *Pelargonium zonale* and tomatos were chosen for this purpose.

Twenty-four young plants of even growth were potted in each case and the effects of the use of weekly and fortnightly applications of

weak and strong solutions observed, against control, in accordance with the plan of experiment shown below.—

Pelargonium zonale and Tomatos in Pots.

ARRANGEMENT OF POTS.

Weak.	Control.	Strong.	
W1	C1	S1	
W2	C2	S2	Weekly Treatment.
W3	C3	S3	
W4	C4	S4	
W5	C5	S5	
W6	C6	S6	Fortnightly Treatment.
W7	C7	S7	
W8	C8	S8	

Solutions used: Strong—1 oz. permanganate dissolved in 2 gallons of water.

Weak—½ oz. permanganate dissolved in 2 gallons of water.

Application: 250 c.c. of each solution (or of water for control) per pot.

The first application to the *Pelargonium zonale* plants was given on March 12, 1937, and to the tomatos on April 1, 1937.

In addition to these pot experiments, four boxes of young lettuce plants of even growth were selected for similar weekly and fortnightly treatment with strong and weak solutions, as follows :—

Box I . . . Strong solution fortnightly.
Box II . . . Weak solution weekly.
Box III . . . Weak solution fortnightly.
Box IV . . . Control.

Solutions used: Strong—1 oz. of permanganate dissolved in 2 gallons of water.

Weak—½ oz. of permanganate dissolved in 2 gallons of water.

Application: 500 c.c. of solution (or of water for control) per box.

The development of the growth of the plants in the pots and boxes showed distinction between the treated plants and control at early stages in the experiment.

This distinction was seen in the darker green coloration of the leaves, in more vigorous growth and in all-round development—corresponding to the improvement which would normally be associated with the use of stable manure.

The *Pelargonium zonale* pots were first treated on March 12, the lettuces on March 19 and the tomatos on April 1. The distinction between treated and untreated plants was first apparent on the lettuces, which were photographed three weeks after the experiment was begun. The illustration (fig. 162) shows the effect of weak weekly applications against "control"—an impression of the comparative growth being obtainable from the heights of the plants seen against the white labels at the backs of the boxes. The experiment was discontinued on May 6 owing to all plants being badly attacked by "tip burn."

The tomato plants were photographed on May 6 and were exhibited at the Society's Spring Show at Chelsea shortly afterwards. The plants seen in the illustration (fig. 163), reading from left to right, are :—W4 (weak solution weekly), C4 (control) and S4 (strong solution weekly). The treatments were continued until the end of June.

The *Pelargonium zonale* pots also showed similar distinction in growth between treated and "control," applications ceasing during June.

In conducting these tests, no attempt has been made, either by weighing or by measurement, to determine accurately the extent of increase of plant growth brought about by the treatment. The object has been to demonstrate that by use of potassium permanganate an increase of plant growth of the nature and characteristics normally associated with the use of stable manure is achieved. When this fact is considered in conjunction with the known property of permanganate to decompose organic matter in the laboratory and with its similar ability to decompose organic matter in the heap, tested in the course of this work, it is reasonable to assume that the manurial effects observed in these tests are attributable to the decomposition of organic matter set up in the soil itself by permanganate.

The work carried out by the writer at Wisley during the past two seasons and his other investigations begun in 1931 have been primarily concerned with the effects produced upon growing grass and upon plant growth generally by the application of permanganate to the soil, rather than with research into the causes of these effects.

The practical horticulturist is essentially concerned with effects, and it is hoped that the present work has provided him with a simple and convenient soil treatment capable of producing beneficial results.

At the same time, it is believed that these results open up a field of fundamental importance in examining the problem of soil fertility from a new angle—namely, the investigation of the best means of promoting the decomposition of soil humus, as an alternative to the nitrogen-phosphate-potash method of manuring.

PHLOX ADSURGENS TORREY.

By Dr. Fred Stoker, V.-P.L.S., V.M.H.

The description "stems diffuse and ascending," applied to *Phlox adsurgens* in American Floras, gives rather a wrong impression. Diffuse and ascending the stems certainly are, but the ascending portion is limited to the terminal few inches (at any rate in British gardens), the remainder being prostrate. Decumbent, in fact, describes the habit better than adsurgent. My concern, however, is not to quarrel with the name, but to convey some idea of the plant.

Though known to American botanists for over half a century, it has not been anything like general in British gardens for more than a few years, nor is it common even now. Popular report does not proclaim it a tolerant plant and, indeed, for some years after introduction its reputation was so dubious that we approached its cultivation with tempered hope rather than with any measure of confidence.

Yet this Phlox, like many other American plants, is more selective than difficult—very complaisant in a place it likes, utterly unresponsive in one it does not. Native to subalpine regions in northern California and Oregon, it frequents, I understand, the edges of woodlands or seeks the association of dwarf shrubs. A humus soil, a certain amount of shade and a humid atmosphere therefore suggest themselves as together forming a suitable environment, and the illustration (fig. 164) is of plants growing in something approaching it. They are at the margin of a small plantation of young Corsican Pines and only fully exposed to the north-east. I should say, though, that in another part of the garden the plant is open to the south and west, but it shows nothing of the luxuriance exhibited by the shaded group. In both instances the soil is lime-free and on the light side.

This is not to say that shade and the other factors together form surroundings in which *P. adsurgens* must inevitably succeed. Their combination is not difficult to secure in a great number of gardens but, for some not apparent reason as yet, does not always meet the plant's desires.

P. adsurgens is a sub-shrubby species. From a slowly extending, slenderly rhizomatous root-stock arise spreading and decumbent stems, round and smooth, from 12 to 18 inches long in shade but less than half that length in sun. The leaves are opposite, ovate, pointed, firm, shining, smooth, from $\frac{5}{8}$ to $1\frac{1}{4}$ inch long, and $\frac{3}{8}$ to $\frac{3}{4}$ inch broad and minutely ciliate at the margin. On the lower part of the stem they are shortly petiolate but gradually become sessile and subcordate upwards until, just below the inflorescence, they appear (but only appear) connate from the close approximation or even overlapping

of their bases. The flowers are borne in terminal cymes; peduncles, pedicels, calyces and corolla tubes are glandular-pubescent; calyx ½ inch long, lobes narrowly triangular; tube of corolla ⅞ inch long, much paler than limb; corolla 1⅛ inch in diameter, a lovely soft pink in colour and made up of five obovate, discrete, minutely glandular and slightly fringed lobes.

The plant is very easily propagated from cuttings and its life is prolonged by shortening the stems after flowering.

SWEET CORN AT WISLEY, 1938.

TWELVE varieties of Sweet Corn (Maize) were sent for trial in the spring of 1938. The seed was sown in small pots, singly, under glass, on May 24, and the seedlings planted out in rows 2½ feet apart, 1½ foot separating the plants in the rows, on June 15. All made good growth and fruited freely. They were finally judged on September 1 and 15, 1938, by the Vegetable Panel.

Golden Early Market (introduced by Messrs. Gills Bros. Seed Co., and sent by Messrs. Ferry-Morse Seed Co., San Francisco, California, U.S.A.). **A.M.** September 1, 1938, as an early variety.—2½ feet. Cobs 6 to 8 inches long, 3 to a plant; seeds large creamy-yellow, 14 rows on a cob, of good flavour; fit for use August 16.

Gold Cross Bantam (sent by Messrs. Watkins & Simpson, Drury Lane, Covent Garden, W.C.). **A.M.** September 15, 1938.—3 feet. Cobs 7 inches long, 4 to a plant, of good quality; seeds large, cream, 12 rows on a cob, of good flavour; fit for use September 14.

Golden Bantam (sent by Messrs. Carters' Tested Seeds, Raynes Park, S.W.). **H.C.** September 15, 1938.—4 feet. Cobs 7 to 8 inches long, 4 to a plant, seeds large, pale cream, 8 rows on a cob, of good flavour; fit for use September 8. Also sent by Messrs. Ferry-Morse, a less regular stock.

The following varieties were included in the trial but were passed over by the Judging Committee; the sender and date of maturing is given after each:

STONOR'S EARLY (Stonor), August 25; EPICURE (Carters), August 31; FORDHOOK (Carters), August 31; CERTAINTY (Harrison), September 8; CARMEL GOLDEN (Ferry-Morse), September 10; EARLY FORDHOOK (Watkins & Simpson), September 12; GOLDEN GIANT (Carters). September 14; HOWLING MOB (Carters), September 14; CARTERS' IMPROVED (Carters), September 14.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1938.

Chrysanthemum 'Alfred Edney.' **A.M.** October 25, 1938. From Mr. H. Woolman, Shirley, Birmingham. A large Japanese exhibition variety having broad buff-red loosely incurving florets with a conspicuous old-gold reverse.

Chrysanthemum 'Annie Curry.' **A.M.** October 25, 1938. From Mr. H. Woolman. A white incurved exhibition variety faintly tinged with cream. The blooms are of excellent form and substance.

Chrysanthemum 'Delarosa.' **A.M.** October 25, 1938. From Messrs. K. Luxford, Sawbridgeworth. A large-flowered rose-pink single variety with several rows of broad florets and a white zone round the disc.

Chrysanthemum 'Duke of Kent.' **A.M.** October 11, 1938. From Mr. H. Woolman. A large white Japanese exhibition variety with very broad loosely curling florets.

Chrysanthemum 'Fernanda.' **A.M.** October 25, 1938. From Messrs. K. Luxford. A large-flowered amber-yellow single variety with several rows of florets.

Chrysanthemum 'Marius.' **A.M.** October 25, 1938. From Messrs. K. Luxford. A large-flowered white single variety with several rows of very stiff broad florets.

Chrysanthemum 'Nellie Merritt.' **A.M.** October 11, 1938. From Mr. H. Woolman. A large deep yellow Japanese exhibition variety with broad slightly curled florets.

Chrysanthemum 'P. Sudbury.' **A.M.** October 25, 1938. From Mr. H. Woolman. A large loosely incurving old-rose Japanese exhibition variety with a silvery-pink reverse.

Chrysanthemum 'Venetia.' **A.M.** October 25, 1938. From Messrs. K. Luxford. A large-flowered crimson-scarlet single variety with several rows of broad florets and a wide yellow zone round the disc.

Crocus pulchellus. **A.M.** October 11, 1938. From A. Simmonds, Esq., West Clandon. This pretty species belongs to a group from Eastern Europe and Asia Minor which flower in autumn before the leaves appear. *C. pulchellus* has dainty flowers of pale lavender, striped with blue veins, an orange throat and white anthers. There is also in cultivation a good white form, which received the **A.M.** in 1915.

Fasciculatia pitcairniifolia. **A.M.** October 11, 1938. From the Corporation of Falmouth, Cornwall. A Chilian Bromeliad, remarkable for the brilliant colour of its foliage. The short and thick stem bears a large number of narrow, curved, spiny-toothed leaves, the upper surface of the inner ones being bright red in the lower half. The centre of the rosette is occupied by a dense cluster of bright

blue, yellow-stamened flowers. This can be grown successfully in the open in the South and West, but appreciates protection elsewhere.

Laeliocattleya × 'Balkis' gloriosa. A.M. October 25, 1938. This vigorous hybrid bore a couple of large flowers of model form, the sepals and broad petals bright, rich rose, the labellum crimson-purple and undulated at the margin. The result of crossing *L.c.* × 'Queen Mary' with *Cattleya* × *Peetersii*. Raised by Messrs. H. G. Alexander, Tetbury, Glos.

Schizostylis coccinea grandiflora. A.M. October 25, 1938. From Messrs. M. Prichard, Christchurch. The Kaffir Lily is now well known and highly esteemed for its brightly coloured, late flowers and a degree of hardiness which many other popular South African plants lack. The present variety has sturdy stems 18 inches long bearing fine crimson flowers fully 3 inches across.

GARDEN NOTES.

The Carmine Cherry.—Capt. KINGDON WARD sent home from his 1931 expedition to Northern Burma *Prunus Puddum* under the collector's number 9314. The seed was sown in February 1932. Three seedlings came up very quickly and were planted out in a sheltered place in 1934, facing south. One tree was given away to a friend and the other two are flowering now (April 15, 1938) for the first time with a few flowers. The flowers have a deep red calyx and deep rose petals. *P. Puddum* has not, I believe, proved hardy in the past, but these seeds were taken from a tree growing on the mountains at an elevation of 7000–8000 feet, and the young trees have been quite unprotected for the last four years, so perhaps Capt. KINGDON WARD has found a hardy form of *P. Puddum.* Capt. KINGDON WARD in the collector's note calls it 'the Carmine Cherry,' and says, 'the gorgeous colour of the crowded flowers is a never-to-be-forgotten sight.—*F. C. Stern.*

Rose 'Joanna Bridge.'—This rose was planted, after selection from the Wisley rose trials, on the Rose-walk at Wisley about 1926. It has never failed to flower well and is pruned but little every year. The tallest of the bushes is over six feet in height and, as the illustration (fig. 165) shows, it forms a fine group.

Phyllodoce nipponica (*Makino*) *var. amabilis* nov. comb.—In the Botanical Magazine of 1911, under t. 8405, the late Dr. OTTO STAPF described and figured a Phyllodoce under the name *Phyllodoce amabilis* Stapf. It was subsequently found to be conspecific with the Japanese *P. nipponica* Makino (Bot. Mag. Tokyo, xix, 131) and the name *P. amabilis* was consequently dropped or, at the most, used as a synonym.

REHDER, however, perhaps misled by the once-prevailing impression that the plant was native to North-west America, made of it a variety of *P. empetriformis* Don and gave it the designation *P. empetriformis* var. *amabilis* Rehd. [Manual Cult. Trees and Shrubs, 706 (1934).]

A few years ago I raised *P. nipponica* from home-saved seed and among the resulting plants are individuals which correspond exactly with STAPF'S *P. amabilis.* They differ from the type in the following particulars:

	P. nipponica (type).	Variant.
Pedicel.	Green.	Red.
Sepals.	Pale green, occasionally tinged pink; 3·75 mm. long.	Red; 3 mm. long.
Corolla.	Pure white; 8 mm. long; 9 mm. wide at mouth.	Reflexions of lobes pink; 7 mm. long; 6 mm. wide.
Anthers.	Yellow-brown	Rich crimson.
Leaves.	10 mm. long; 2 mm. wide	7 mm. long; 1·75 mm. wide.

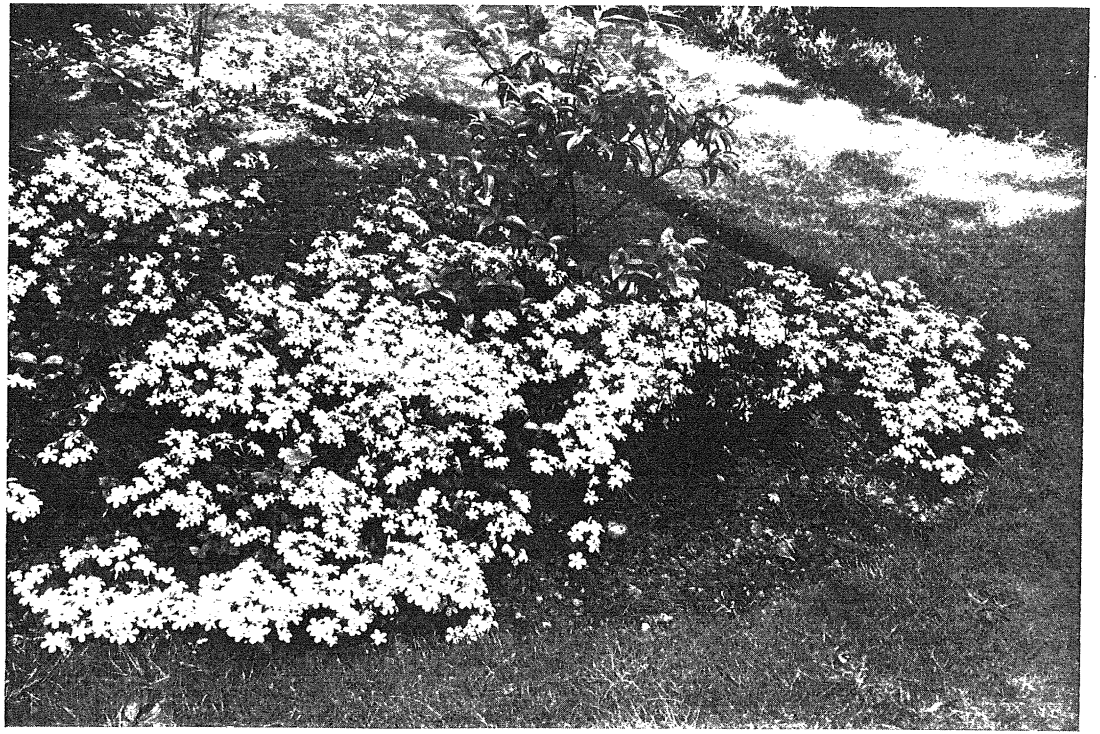


FIG. 164.—PHLOX ADSURGENS IN DR. STOKER'S GARDEN.

[*To face p.* 570.



FIG. 165.—ROSE 'JOANNA BRIDGE' AT WISLEY.



FIG. 166.—PELARGONIUM TOMENTOSUM NATURALIZED AT TRESCO.

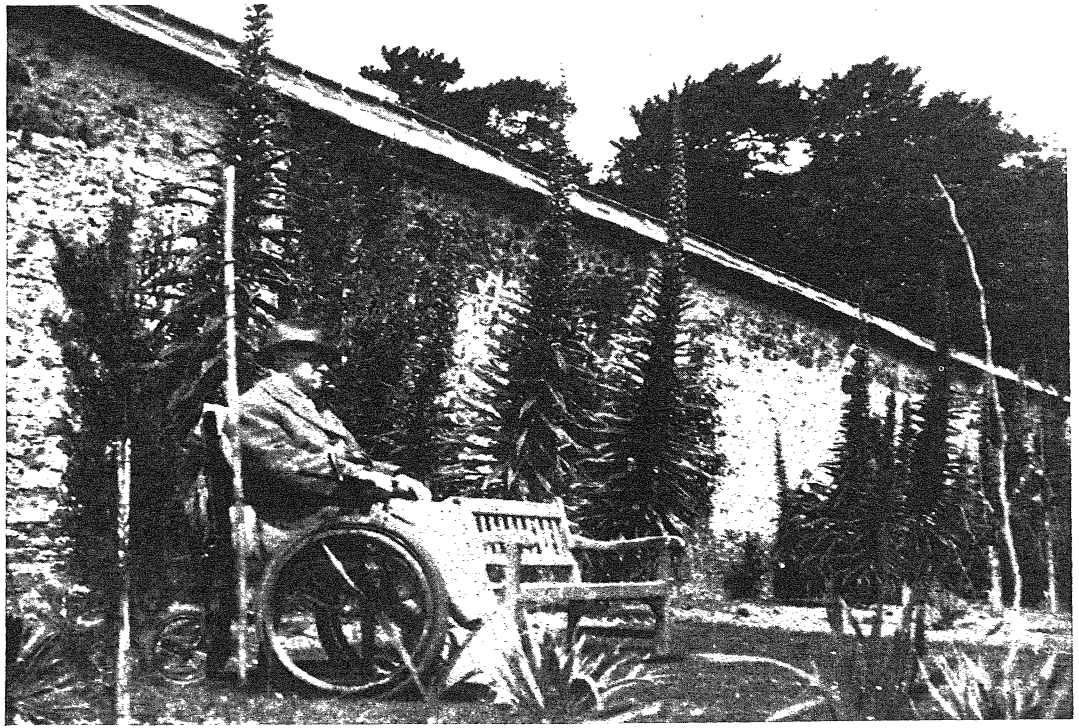


FIG. 167.—GIANT ECHIUMS AT BIDEFORD.

[*To face p.* 571.

The differences, it will be seen, are in certain dimensions and in the colour of certain organs. None of them impressive when taken singly, in the aggregate they are sufficient to enable type to be distinguished from variety at a glance and also, I submit, to justify the placing of the latter as *P. nipponica* var. *amabilis*.

Apart from its larger size and more robust growth, *P. empetriformis* may be at once separated from *P. nipponica* by its semi-procumbent habit (that of *P. nipponica* being erect) and by its rich pink, urceolate corolla (that of *P. nipponica* being open-campanulate and of the colour already mentioned).—*Fred Stoker.*

Anagallis tenella.—The low-growing, but very beautiful, Bog Pimpernel, is met with in many parts of the country in boggy places, usually in association with Sphagnum moss and water-grasses, which make some search imperative before it is discovered. Never had I seen it growing in such prominence and profusion as to colour the landscape, until I saw it at Tresco in the Scillies. The soil was peaty and sparsely covered with grass and showed signs of being boggy in a wetter season. The area more or less carpeted with the plant ran into acres.—*E. Brown.*

Pelargonium tomentosum.—The peppermint-scented *Pelargonium tomentosum* was much cultivated years ago, but is now seldom seen in our greenhouses. On Tresco, Isles of Scilly, it is one of the plants which have escaped from the Abbey Gardens and is successfully fighting the native vegetation, even Bracken. Its soft shoots rise to considerable heights to overtop its competitors, and eventually gain supremacy. The photograph (fig. 166) shows a clump covering many square yards, which is still spreading by its branches rooting and throwing up strong growths. The white haze is caused by the myriads of tiny white flowers which it has produced, and which completely hide its fair-sized leaves.—*E. Brown.*

Giant Echiums.—I first saw these plants grown to any extent during a visit to a friend resident in South Devon in the summer of 1936.

As I greatly admired them, although at that time (August) they had almost entirely gone to seed, my friend pulled down a stalk and gave it me, saying, " See what you can do with that."

On the upper part there were still blue flowers on the stalk, and the seed was nowhere really ripe.

However when the stalk dried, the seed was sown and came up readily. We bedded out the small plants, in ordinary garden soil, under a south-facing wall, in May 1937.

During the summer of 1937 the plants made good growth and by the autumn they were approximately 2 feet high. We pulled up half of them as they were too close. The wall is about 200 feet long. In December 1937 we had a cold snap. I am not quite sure how many degrees of frost were registered, but locally I am informed there were 12 degrees. The lower leaves of the Echiums were turned black,

possibly by the frost at that time, though I believe this is a not unusual winter feature. The hearts of the plants remained perfectly sound. In the spring of this year the plants shot up and expanded so much that we cut down nearly two-thirds of them.

During the spring and right into May we had frosts, and by my thermometer we registered 9 degrees once, 7 degrees twice, and several more of 5 degrees and less. These did not effect the Echiums in the least. The tallest of the plants, well above the shelter of the wall, measure over 13½ feet.

I observe that Echiums should be planted in deep soil. They have deep vertical roots; and until these roots are fully established, the plants will not flower.

I hope to succeed equally well with the red Echiums (*Echium Wildpretii*).—*Sir Hugh Stucley, Bart., Bideford.*

SCABIOSA CAUCASICA TRIED AT WISLEY, 1938.

FORTY-TWO stocks of *Scabiosa caucasica* were sent for trial in the autumn of 1937. They were planted on October 18, 1937, and almost all made good growth and flowered freely the following season. They were judged by a sub-committee of Floral "A" on August 14, 1938, and the awards recommended are given below.

One variety failed to grow, 'Amethyst' (Ruys). Four unnamed seedlings were grown and these are not further referred to. *S. Columbaria rosea* (Ruys) and *S. arvensis* Dark variety (Cumming) were sent, but are not included below.

Flowers White.

Evelyn Braithwaite (raised and sent by Mr. W. Braithwaite, Floral Nurseries, Leeming Bar, Yorks.). **H.C.** August 4, 1938.—3 feet, free flowering. Flower stems stiff, 18 inches long; flowers 3½ inches diameter, creamy-white; disc 1⅜ inch diameter, creamy-white.

The following varieties were included in the trial:

CAUCASICA ALBA (Ruys)
MISS WILLMOTT (Ruys)
IVORY QUEEN (Braithwaite)
ETHEL (Cummings)
MOTHER OF PEARL (Cummings)

Flowers of Lavender Shades.

No awards were recommended to varieties of this section; the following were grown:

SILVER KING (Cummings)
FLORAL BEAUTY (Braithwaite)
BRIDESMAID'S CHOICE (Souter)
SWALEDALE (Braithwaite)
MILDRED (Cummings)
FLORAL QUEEN (Braithwaite)

Flowers of Light Lavender-Mauve Shades.

No awards were recommended to varieties in this section; the following were grown:

PRIDE OF EXMOUTH (Cummings)
WENSLEYDALE (Braithwaite)
ALL BLUE (Braithwaite)
JOYCE (Cummings)
IDA STATHER (Cummings)
TORWOODLEA (Cummings)
CLIVE GREAVES (Therkildsen, Ruys)
SCHÖNE VON EISMACH (Ruys)

Flowers of Deeper Lavender-Mauve Shades.

Wanda (raised and sent by Mr. W. Braithwaite). **H.C.** August 4, 1938.—2¾ feet, very free flowering. Flower stems 18 inches long, stiff; flowers 3 inches diameter, deep lavender-mauve; disc 1¼ inch diameter.

John Haskins (raised by Mr. Haskins of Clevedon, nr. Bristol, and sent by Messrs. Hewitt, Banbury Road, Stratford-on-Avon). **H.C.**

August 4, 1938.—2½ feet, very free flowering. Flower stems 16 inches long, stout; flowers 3½ inches diameter, deep lavender-mauve; disc 1½ inch diameter. Also sent by Mr. Cummings, no award recommended to this stock.

The following varieties were included in the trial:

MOERHEIM STRAIN (Ruys)
CONSTANCY (Therkildsen)
CHARM (Souter)
PENHILL BLUE (Braithwaite)

Flowers of Lavender-Blue Shades.

George Souter (raised and sent by Mr. G. B. M. Souter, Rosemary, Wellington Road, Chichester). **A.M.** August 4, 1938.—2 feet, of compact habit and very free flowering. Flower stems very stout, 18 inches long; flowers 3 inches diameter, lavender-blue; disc 1⅜ inch diameter.

The following varieties were grown in the trial:

MRS. W. C. BLAKEWAY (Hewitt)
DIAMOND (Ruys)
MARION (Cummings)
JACKMAN'S VARIETY (Jackman)
ISAAC HOUSE (Ruys)
BARBARA JACKMAN (Jackman)
MARY WITCHELL (Ruys)

BOOK REVIEWS.

"Alaska Wild Flowers." By Ada White Sharples. 8vo. vii + 156 pp. Illus. (Oxford Univ. Press, London, 1938.) 14*s*.

In this little book the author has set forth, for the instruction of the traveller and inquirer, the flora of Alaska where the climate is much the same as Northern Canada only with shorter summers, more severe and longer winters, with the same blanket of snow to protect plant life. But there is one great difference; if the summers are shorter, there are practically twenty-four hours of daylight in which the plants make the most of a short life but a gay one, and thrive they do, as I know from personal experience in the Yukon Territory where I spent a few gorgeous weeks in 1922. It is a grand country with a grand, though small, lot of people—confirmed optimists—who would give the grizzling Englishman a lesson in how to face life under none too rosy circumstances, for they are the remnants of the gold rush days when fortunes were made and lost in the twinkling of an eye. Most of them are old now, and haven't found fortunes, but they remain in that great spreading North West land whose spell has caught and held them. Some cannot afford to leave, some love the freedom of a life away from the shams and shibboleths of civilization, and practically all are optimists. Poor too as the proverbial church mouse, they still carry on, for if they did not find gold yesterday or to-day there is always hope ahead for to-morrow. They live in their tiny shacks and shanties, vigorous, peaceful, hardy people, like the plants that thrive in the rich soil around them, and in the glorious sunshine of the short summer season.

The home-abiding Englishman generally thinks that the sub-Arctic is always embedded in snow and icebound, with below-zero temperatures, and it may surprise him to learn that mosquitos and winged pests of all kinds are as plentiful as in tropical countries, and so numerous and hungry that veils are a necessity for any peace, and despite their heavy fur, the "Huskies," poor beasts, get so bitten round their eyes or on any part of their person not protected with fur, that they are half blind and present a pitiful appearance. As Miss SHARPLES says, berried shrubs are plentiful and no North-Westerner grows raspberries, because they thrive everywhere and all the housewife need do is to take her basket and pick to her heart's content. Which reminds me of a true story told me by the principal actor. She and a friend had set out to get the raspberries for jam-making and they separated so as to quarter the ground properly. One was busy picking when she thought she heard her neighbour working on the far side of the dense jungle of raspberry canes and called out asking how she fared. Rather annoyed at getting no reply she walked round the bushes to find that it wasn't her friend, but a brown bear contentedly sitting on his broad base and gathering the berries on which he was guzzling. The lady fled for home, the bear remained in possession quite unperturbed, for bears in the wilds of Canada have very little fear of humans and are harmless as a rule. However, to return to the book. It is a useful little guide, but I think the price too high for a very small book, and one where I must regretfully add that the illustrations are distinctly poor in quality though numerous.

EVELYN BYNG OF VIMY.

"The Genus Sedum: a systematic Essay." By H. Fröderström. 8vo. 75 + 111 + 126 + 262 pp. 276 plates. (Elanders, Goteborg, 1937.)

This long account of the genus Sedum consists of collected papers from the Acta Horti Gothoburgensis written between 1930 and 1935. It is written in English and deals with all known species of the genus, both those in cultivation and those known only from dried specimens. Many of the species are illustrated by photographs of dried specimens, and some thousands of line drawings illustrate the details of leaf and flower structure.

The treatment for each species is (1) the name, (2) reference to original description and to other articles dealing with it, (3) synonymy, (4) full description, (5) distribution, (6) variations, (7) notes.

A list of species collected in China, with the collector's numbers, and a key to the whole genus are appended, and there is an excellent bibliography.

The book is finely printed and produced, and will be found invaluable to all interested in the genus and who desire to know something of the plants introduced since Praeger's Monograph in this JOURNAL in 1921 or about the species yet to be brought into cultivation.

"A Summary of Legislation relating to the Introduction of Plants into the Colonial Dependencies of the British Empire as at the end of December 1936." 8vo. (H.M. Stationery Office, London.) 1*s*.

It is often desired to send plants to friends abroad, and Fellows will no doubt be interested to know of this authoritative publication giving the rules which must be followed to enable this to be done.

"Planning and Planting your own Place." By Louis Van de Boe. 8vo. 290 pp. (Macmillan, New York, 1938.) 25*s*.

This book is intended as a practical guide in garden construction and maintenance for American home owners. It has been written to serve in particular those resident in the United States north of the Mason and Dixon line and westward to the Rockies, and for the benefit of those who will carry out the greater part of the construction and maintenance themselves.

The opening portion of the book deals fully with the important question of the proper relationship of the house and grounds. This is followed by practical advice on grading, the construction of walks, drives and lawns, and the use of planting. In respect of the latter, considerably more attention is given to "foundation planting" than would be deemed necessary in this country, owing to the fact that in many American houses the ground floor level is raised many feet above the outside ground level and there is thus more need for planting around the base of the house.

The book includes a number of lay-out plans for small gardens, giving details of the planting, as well as lists of plants for various purposes. There is also a useful chapter on maintenance hints giving particulars of pests which attack the more familiar trees, notes on pruning and tree surgery, and a list of tools for the garden.

It contains a number of photographs and line drawings illustrating practical points, and although primarily intended for Americans, there is a large amount of good advice in this book which those about to make a new garden in this country should find of real value.

J. E. G. WHITE.

"Trees and Men." By E. Hughes-Gibb. 8vo. viii + 171 pp. (Moring, London, 1938.) 8*s*. 6*d*.

The title of this book explains its purpose. It is a book perhaps not easy to read for it consists largely of opinions expressed by various people not always welded into a whole. In spite of this the book is one calculated to stimulate thought on the value of trees in human life.

"More Green Fingers: another present for a good gardener." By Reginald Arkell. 8vo. 96 pp. Illus. (Jenkins, London, 1938.) 3*s*. 6*d*.

It is usually unwise to try to repeat a success, and those who delighted in "Green Fingers" might well fear that to attempt another success on the same theme might fail. But be assured it has not failed. It would be foolish to say this attempt succeeds better than the former—it could not—but it falls no whit behind, and if you would enjoy a good many chuckles and appreciate some kindly poking of fun you will do both if you dip into this book. The charming and often witty drawings by Eugène Hastain on nearly every opening deserve more than a glance too.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

REPORT OF THE COUNCIL

FOR THE ONE HUNDRED AND THIRTY-FOURTH ANNUAL MEETING OF THE SOCIETY, TO BE HELD IN THE LECTURE ROOM OF THE NEW HALL, GREYCOAT STREET, WESTMINSTER, AT 3 P.M. ON TUESDAY, FEBRUARY 22, 1938.

Patrons.—It is a matter of great satisfaction to be able to record that Their Majesties King George VI and Queen Elizabeth have graciously granted their patronage to the Society, thereby showing their continued interest in its work.

In honour of Their Majesties' coronation a comprehensive exhibit of plants drawn from all over the Empire was staged at Chelsea. The Council desires to express its thanks to the Governments of the Dominions, Newfoundland, India and the Mandated Territories for their co-operation and assistance in bringing together this collection.

The Society's Progress.—This year closes with a well-maintained increase in the roll of Fellows and Associates of the Society. The total number on November 10, 1936, was 33,447, and the figure at the corresponding date of this year stands at 35,327, or a net increase of 1,880. In 1936 the net increase was 1,799.

Loss by Death in 1937.	
Honorary Fellows ...	1
Associates of Honour ...	4
Life Fellows	14
4 Guinea Fellows	5
2 ,, ,, ...	244
1 ,, ,, ...	203
Associates	3
	474

Loss by Resignation.	
4 Guinea Fellows	8
2 ,, ,, ...	600
1 ,, ,, ...	1,139
Associates	76
Affiliated Societies ...	28
	1,851

Elections in 1937.	
Associates of Honour ...	4
Life Fellows	22
4 Guinea Fellows	22
2 ,, ,, ...	1,370
1 ,, ,, ...	2,610
Associates	119
Affiliated Societies ...	58
	4,205
Deaths and Resignations	2,325
Net Increase ...	1,880

Total on November 10, 1936	33,447
Total on November 9, 1937	35,327

Unfortunately the year has not passed without the loss of notable figures connected with the Society's work and with horticulture. Amongst those whose loss is to be deplored are Mr. J. M. Bridgeford, a member of the Council who always took a very active part in the Society's Committee work and in the various trials at Wisley; Sir Herbert Maxwell, Bt., V.M.H., a Vice-President of the Society; Lord Rothschild, V.M.H.; Mr. William Hales, V.M.H., Curator of the Chelsea Physic Gardens; Mr. A. Watkins, V.M.H., of the firm of Messrs. Watkins & Simpson; Sir Cecil Hanbury, a Trustee of the Wisley Gardens; Dr. J. A. Voelcker, Honorary Consulting Chemist to the Society, and Professor Armstrong, both members of the Scientific Committee; Sir Oscar Warburg, a keen amateur gardener and a contributor to the Society's JOURNAL; Mr. R. H. Macaulay of Kirnan, an enthusiastic amateur of rock-plants; and Mr. Thomas Want, a noted horticultural journalist; and of the Associates of Honour: Mr. A. Andrews, late Superintendent of the Public Parks, Plymouth; Mr. W. H. Honess, late head gardener of Walhampton Gardens, Lymington; Mr. W. E. Johnson, late foreman to Messrs. W. Fuller & Son of Newton Abbot; Mr. G. T. Lane, late Curator of the Royal Botanic Gardens, Calcutta; Mr. P. Mann, late Instructor in Horticulture to the Bucks County Council; and Mr. E. Markham, head gardener at Gravetye Manor, East Grinstead.

Fortnightly Meetings and Shows.—The Fortnightly Meetings and Shows in the Halls have been well attended. The exhibits have shown a marked improvement in attractiveness, and the Society's thanks and congratulations are due to those who have so well upheld the reputation of the Society's Shows. The Calendar for 1938 has been arranged so that all the Meetings and Shows from the Annual Meeting on February 22 to the end of October will be two-day Shows.

The Daffodil Show.—The Daffodil Show was held on Thursday and Friday, April 15 and 16. In spite of adverse weather at the critical period the entries showed a record both in quality and numbers. An account of the Show has been published in the Daffodil Year Book for 1937. The Show in 1938 will be held on Tuesday and Wednesday, April 12 and 13. The Schedule is obtainable from the Secretary.

Early Market Produce Show.—This Show was held for the sixth time in the Old Hall of the Society on Thursday and Friday, April 15 and 16, and will be held in 1938 on Tuesday and Wednesday, April 12 and 13. These Shows have had great value in demonstrating the possibilities of the production of early vegetables, flowers and fruits of first-class quality in this country. On the occasion of the Show next year Mr. André Simon has promised to lecture on "Unusual Vegetables for the Garden and the Cook."

The Chelsea Show.—Their Majesties the King and Queen, Her Majesty Queen Mary and other members of the Royal Family honoured

the Society by visiting the Chelsea Show, which was held on Wednesday, Thursday and Friday, May 26, 27 and 28. A noticeable feature of the Show was the arrangement of the ground, which was changed by the replacement of the series of small tents by a second large marquee. This proved popular and more convenient for visitors. Another feature of the Show was the special exhibit, already referred to, of plants from the Empire to commemorate the accession of His Majesty. The Council desires to acknowledge the valuable assistance received from the Director of the Royal Botanic Gardens at Kew and from many owners of gardens and nurserymen.

In commemoration of the accession of His Majesty a silver-gilt cup was presented to each winner of a gold medal.

The Chelsea Show in 1938 will be held on Wednesday, Thursday and Friday, May 25, 26 and 27.

The Autumn Show.—The Autumn Show was held in the National Hall, Olympia, on Wednesday, Thursday and Friday, September 29 and 30 and October 1. Owing in part to the favourable weather the Show was finer than any Autumn Show previously held, and increased space for the exhibits had to be provided. It is to be regretted that it has not been possible to make arrangements for an Autumn Show in 1938 as no suitable accommodation is available. If the cancellation of any Exhibition at a convenient date releases any of the suitable Halls, an announcement will be made through the Society's JOURNAL and the Press.

The Lily Group.—The four meetings and the visits to the garden of Major the Hon. John Astor and to the Nurseries of Messrs. Constable and of Messrs. The Hocker Edge Gardens were well attended. A similar programme has been arranged for 1938.

The Iris Group.—For the year 1938 two meetings have been arranged.

Wisley : The Garden.—The year 1937 has in general been favourable for vegetation, and the condition of the collections at Wisley is satisfactory. Many plants new to the garden have been added to the collections and a special endeavour has been made to increase the number of trees and shrubs which are attractive in their autumn-coloured foliage. The gardens were opened on Sundays until the end of October, and Fellows have again had the opportunity of seeing the vivid colours of foliage and fruits, which are at their best during that month.

Flower and Vegetable Trials.—During 1937 the Trials held at Wisley included, besides those comprised in the standard collections, China Asters (Early Doubles), Annual Carnations, Annual Bedding Lobelias, *Lupinus polyphyllus* varieties grown from seed, and Montbretias. The Montbretias will in future form a standard collection. The season was satisfactory for these Trials, and the trial plots proved a continuous attraction to Fellows.

Of Vegetables the following Trials were carried out: Autumn Sown Cabbages, Maincrop Peas and Leeks. The Trials of Cos Lettuce were not satisfactory and will be repeated during 1938. The invited Trial of Globe Artichokes from seeds and plants did not take place as there was no response to the invitation to contribute to this Trial.

Demonstrations of Practical Garden Operations.—These demonstrations of practical work continue to be popular and of interest to Fellows of the Society and their friends. The attendance at each demonstration was good and as the weather was generally favourable it was possible to carry out the necessary work to the best advantage. During 1938 these demonstrations will be repeated on the following dates:

Mar. 9, 10.—Seed Sowing, Indoors and Outdoors.
,, 16, 17.—Rose Pruning.
Apr. 6, 7.—Spring Spraying of Fruit Trees, and Pruning of Shrubs.
July 20, 21.—Summer Pruning of Fruit Trees and Shrubs.
Aug. 24, 25.—Vegetative Propagation of Plants.
Nov. 9, 10.—Planting Fruit Trees and Roses.
Dec. 7, 8.—Pruning of Fruit Trees.

Battleston Hill.—Since the acquisition by the Society of this piece of natural woodland adjoining the garden, a considerable amount of work has been carried out by the staff, and large numbers of Rhododendrons, Azaleas, and other shrubs and trees have already been planted. Further planting is being continued during this winter, care being taken to retain as fully as possible the woodland character of this portion of the garden. A constant supply of water has now been made available here. The Council desires to record its grateful thanks to Lord Aberconway, Mr. R. G. Horsfall, Mr. Lionel de Rothschild, Mr. J. B. Stevenson, Mr. E. K. Wilson, and Messrs. Walter C. Slocock, Ltd., for their gifts of Rhododendrons and other plants.

Visitors.—The total number of the visits to Wisley of Fellows and their friends shows a considerable increase, more than 40,000 having entered the garden during the year. The number of non-Fellows who paid the entry fee to visit the garden was about 1,480. Many parties of affiliated and other Horticultural Societies, as well as of students in Horticulture, also visited Wisley during the summer months.

Joint Commercial Fruit Trials.—The area of the trial grounds has been increased by one acre. New varieties have been accepted for trial and further varieties have been added to the standard collection.

A new sub-station has been established at Askham Bryan, Yorks, and the sub-station in Norfolk has been discontinued.

An increased number of growers and Fellows have visited the trials and many of the new varieties of promise have attracted considerable attention.

Pollination experiments and the recording of the vegetative characters of all kinds of hardy fruit have been continued.

An exhibit of new Apples undergoing trial was staged at the Imperial Fruit Show held in Birmingham.

The Wisley Laboratories: Investigations.—The tests of various growth substances used to facilitate the rooting of cuttings have been considerably extended, and the list of responsive species has been lengthened. There yet remains a number of plants which prove very difficult to propagate by these methods.

The spread of the leaf-hopper of American origin on ornamental shrubs has been noticeable during this year and is under investigation. A pest new to this country attacking Castanea sp. has been recorded. Further investigations concern the biologic strains of plant parasitic nematodes.

This year's test of varieties of Antirrhinums for resistance to rust has given promising results, as two varieties possessing good flowers remained entirely free from disease under conditions of the heaviest infection. The winter killing of Wallflowers is under continued investigation.

School of Horticulture and Examinations.—A limited number of external students, who are Associates of the Society and resident in the neighbourhood, have been allowed to attend the various courses of instruction. The number of applications received exceeded the accommodation available.

During the year the practical examinations for the National Diploma in Horticulture and the Teachers' Diploma have, as hitherto, been held at Wisley.

Advisory Services.—The advisory services offered to Fellows and other inquirers continue to occupy a large proportion of the time of the staff. This year more soil samples have been submitted for opinion and examination than in previous years. Many plant galls have been sent for determination.

Educational Exhibits.—Some twenty educational exhibits have been staged at the Chelsea Show, at Olympia and at the fortnightly meetings of the Society, and also at the shows of Affiliated Societies.

Conferences and Lectures.—Members of the laboratory staff have attended various horticultural and scientific conferences to report on the progress of the Wisley investigations dealing with physiology, entomology and mycology, and to hear of investigations elsewhere.

Visiting Deputations.—An increased number of deputations, particularly of chemical manufacturers and foreign entomologists, have visited the laboratory.

White Fly Parasite.—The parasite has again been distributed from Wisley. The enlarged accommodation provided in 1936 has enabled the continued demand to be met.

Lectures at the Hall.—The Council desire to record their gratitude to the lecturers who assisted at the Fortnightly Meetings, and especially to Dr. E. J. Salisbury for his Masters Memorial Lectures on "The Plant and its Water Supply." Mr. F. J. Chittenden will deliver the Masters Memorial Lectures for 1938 on October 25 and November 8 on "The Behaviour of Plants."

The Society's Publications.—The following publications have appeared during the year: the "Lily Year-Book for 1937"; the "Daffodil Year-Book for 1937"; the Index to all the Volumes of the JOURNAL, which not only gives the contents of the JOURNAL but also the awards to plants up to and including 1935. The pamphlet on "Some Good Garden Plants," being a record with cultural notes on plants that have received the Award of Garden Merit is ready for publication.

The Lindley Library.—Over 1,500 persons have consulted the books in the Library during the year, and in addition 1,560 books have been loaned.

Additions to the Library by gift or purchase (apart from the Cory Bequest) include Iwasaki, "Honzo zufo," Ed. 2, 1921 (95 vols.), containing reprints of the earliest illustrations of Japanese plants; F. C. Taylor, "Coloured Drawings of Orchids done in Burmah, 1858–59"; Belon, "Les observations de plusieurs singularitez . . . en Greece, Asie, Judée, Egypte, etc.," 1555; Degener, "Flora Hawaiiensis," 1932–35 (2 vols.); Godman and Salvin, "Biologia Centrale-Americana, Botany," 1879–1915 (5 vols.); "The Arabic herbal of Ibn El. Beithar, Traité des simples," 1877–83 (3 vols.); "Orta Aromatum et simplicium aliquot medicamentorum historia," 1567; Shigemori, "Nippon teien shi zukan," 1936–37 (9 vols.), illustrating many types of Japanese Gardens; White and Sloane, "Stapeliae," Ed. 2, 1937 (2 vols.).

The Society's Examinations.—The results of the examinations in Horticulture for 1937 were encouraging. The National Diploma in Horticulture has been awarded to 12 candidates.

Twenty-nine candidates passed the Preliminary Examination.

In the General Examination Certificates were awarded to 343 Senior, and 117 Junior candidates. In the Teachers' Preliminary Examination in School and Cottage Gardening 259 candidates were successful, of which 10 were awarded the Advanced Certificate—one candidate gaining a "Pass with Honours."

At the British Floral Art Diploma Examination, Diplomas were awarded to 7 candidates. The new Examination for the National Certificate in Elementary Horticultural Practice, for the students at

Farm Institutes, was inaugurated this year and was well supported. Eighty-three candidates received the Certificate.

The Victoria Medal of Honour.—The Victoria Medal of Honour has been awarded to Mr. Mark Fenwick, a keen amateur gardener and successful grower of rare plants ; to Mr. W. R. Oldham, a well-known wholesale nurseryman who has specialized in the growing of trees and shrubs ; to Mr. F. C. Puddle, Head Gardener at Bodnant, for his work in the hybridization of Orchids, Rhododendrons and other plants and for his cultural skill ; to Dr. Fred Stoker an amateur gardener well known for his cultivation of rock and other plants, and for his writings on the scientific side of gardening ; and to Dr. H. V. Taylor for his public services to fruit growing and other branches of horticulture.

The Associates of Honour.—The Associateship of Honour has been conferred on Mr. Josh Brace, foreman at Messrs. Rivers' Nurseries, on Mr. D. Campbell, Superintendent of Regent's Park, on Mr. C. H. Middleton, Horticultural Instructor to the Surrey County Council, and on Mr. F. J. Rose, Head Gardener at Townhill Park, Southampton.

The Lawrence Medal.—The Lawrence Medal for the best exhibit staged at the Society's Shows during the year has been awarded to Mr. Robert Bolton for his exhibit of British Ferns, staged on August 17, 1937.

The Holford Medal.—The Holford Medal for the best exhibit of plants and/or flowers (fruit and vegetables excluded) shown by an amateur during the year in the Halls of the Society has been awarded to Lord Rendlesham for his exhibit of Daffodils staged on April 6, 1937.

The Veitch Memorial Medals.—Awards have been made as follows : A Gold Medal to Mr. C. H. Curtis for his services to horticultural journalism over forty years ; a Silver Medal to Mr. J. Coutts for his services in connexion with the Empire Exhibit staged at the Chelsea Flower Show, 1937, in commemoration of Their Majesties' Coronation ; a Silver Medal and £25 to Mr. David Wilkie for his book on 'Gentians' ; and a Silver Medal to Mr. G. Russell for his work in selecting the 'Russell Strain' of Lupins.

The Sander Medal.—The Sander Medal has been awarded to Messrs. Blackmore & Langdon for Begonia 'Scarlet Glow,' shown on June 8, 1937, which was considered to be the best new greenhouse plant of general utility shown to the Society in the course of the year.

The George Moore Medal.—The George Moore Medal has been awarded to Capt. the Hon. H. R. Broughton for Cypripedium 'Diana Broughton' var. 'Alcestis,' shown on December 14, 1937, which was considered to be the best new Cypripedium (fig. 1) shown to the Society in the course of the year.

The Williams Memorial Medals.—The Williams Memorial Medals for the best group of plants and/or cut blooms of one genus (fruit and vegetables excepted) which show excellence in cultivation exhibited during the year have been awarded to Messrs. Armstrong & Brown for their exhibit of Cypripediums staged on January 12, 1937, and to Messrs. Baker for their exhibit of Lupins staged on June 8, 1937.

The Reginald Cory Memorial Cup.—The Reginald Cory Memorial Cup for the raiser of the best new hardy hybrid of garden origin shown to the Society in the course of the year, has been awarded to Mr. C. R. Scrase-Dickins for his Rhododendron 'Little Ben' (*R. neriiflorum* × *R. repens*) shown on March 23, 1937.

The Loder Rhododendron Cup.—The Loder Rhododendron Cup has been awarded to Mr. J. F. Rock, of the Department of Agriculture, Washington, D.C., U.S.A., for the introduction of many species of Rhododendrons as the result of his intrepid exploration of the Mountains of Western China.

The Sherwood Cup.—The Sherwood Cup for the most meritorious exhibit at the Chelsea Show was awarded to Messrs. Allwood Bros. for their exhibit of Carnations.

The Coronation Cup.—The Coronation Cup for the most meritorious exhibit at the Autumn Show was awarded to Messrs. Sutton & Sons, Ltd., for their exhibit of vegetables.

Gifts to the Society.—The Council wishes to thank the many friends and Fellows of the Society for the gifts of plants, seeds and books, Mrs. Hall for gifts of prizes for Gladioli competitions, the Hon. Henry S. Tufton for a silver trophy for a Cymbidium competition, and the Orchid Trade for the presentation of trophies for Orchid competitions for amateurs.

The Council also desires to record its gratitude to Col. F. E. Taylor for a collection of paintings of Burmese Plants; Mr. A. J. Farrer for a collection of paintings and drawings by Reginald Farrer; to Mr. W. J. Stables for a gift of lantern slides of Orchids; Mr. B. J. Beckton for a collection of photographs of Masdevallias; and to Mr. J. Ramsbottom for the gift of 450 packets of seed from the Sherriff Expedition; and for a bequest to the Society of £500 made by the late Dame Julia Mary Tilden of Northwood, Middlesex.

Retiring Members of Council.—The Council desires to express its great regret in the death of Mr. Bridgeford, which occurred shortly before the end of his term of office, and also to record its warmest gratitude for his services and those of the retiring Members, Mr. R. D. Trotter, the Treasurer, and the Hon. David Bowes-Lyon.

The Press.—The Council wishes once more to record its grateful thanks to the Press for their kindly support and goodwill, and for their continued interest in the affairs of the Society.

Committees, Judges and Examiners.—The Society is deeply appreciative of the work of all the members of the various Committees, of the Judges and Examiners who give so freely of their time and to whom the success of the work of the Society is so largely due.

Staff.—The Council desires to thank the Secretary and staff both at Vincent Square and at the Society's Gardens at Wisley for their loyal and efficient work.

Signed on behalf of the Council,

ABERCONWAY,

President.

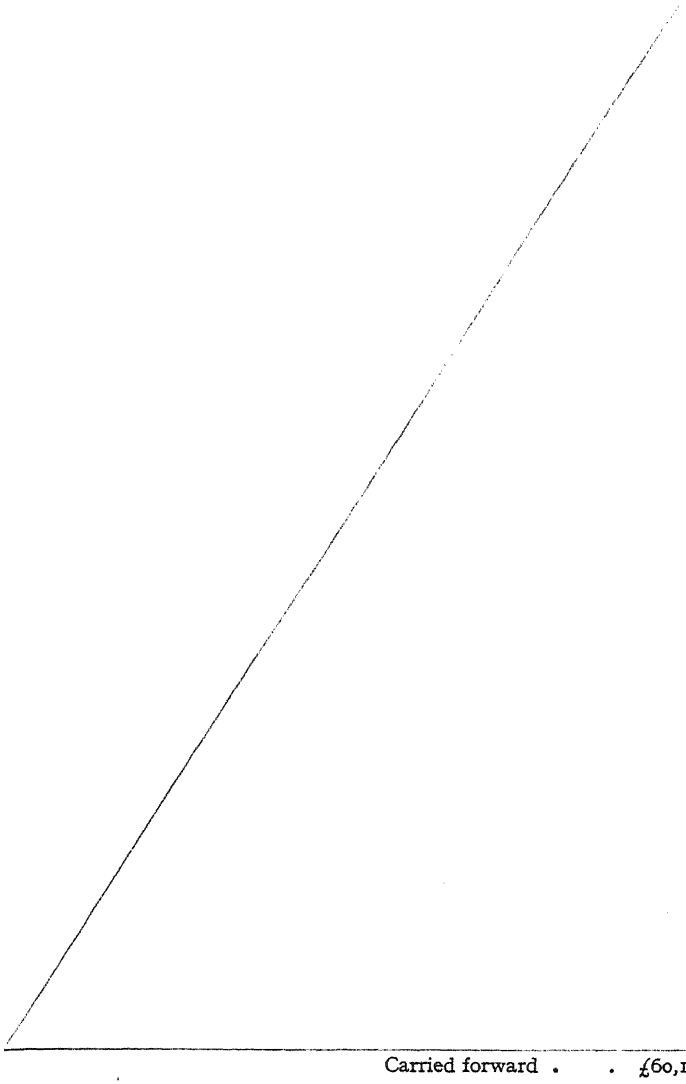
December 31, 1937.

Dr. **ANNUAL REVENUE & EXPENDITURE ACCOUNT**

	£ s. d.	£ s. d.
To LONDON—		
ESTABLISHMENT EXPENSES LESS ALLOCATIONS—		
Rent, Rates and Taxes	3,205 11 1	
Salaries and Wages	7,936 3 9	
Other Establishment Expenses, including Light, Fuel, Stationery, Professional Fees, and Renewals	4,876 6 8	
		16,018 1 6
,, WISLEY—		
Net Expenditure for Year, as per separate Account		17,415 2 7
,, PRINTING AND POSTAGE OF JOURNAL AND OTHER PUBLICATIONS	9,405 8 0	
Less Sales and Advertisements	3,153 4 7	
		6,252 3 5
,, STAFF PENSIONS	1,238 16 0	
Less Contributions by Staff, as per Scheme	531 9 6	
		707 6 6
,, MEETINGS—		
Expenses Labour and Overheads of Special and Other Meetings	3,199 2 7	
Receipts	462 5 9	
	2,736 16 10	
Spring Meeting:		
Expenses Labour and Overheads 9,999 17 4		
Receipts 9,235 10 10		
764 6 6		
Add Empire Exhibit 954 3 7		
Accession Cups 417 11 0		
	2,136 1 1	
Autumn Meeting:		
Expenses Labour and Overheads 2,920 14 5		
Receipts 1,853 17 3		
	1,066 17 2	
		5,939 15 1
,, CUPS AND MEDALS		485 16 1
,, GARDEN INSPECTIONS—		
Expenditure *less* Receipts		11 15 0
,, CONTRIBUTIONS TO LINDLEY LIBRARY, as per Trust Account—		
Purchase of Books	438 18 2	
Salaries, etc.	615 1 6	
		1,053 19 8
,, SPECIAL EXPENDITURE—		
E. K. Balls Expedition	25 0 0	
W. E. T. Ingwersen Expedition	10 0 0	
Captain Kingdon Ward Expedition	102 18 0	
Donation, Royal Geographical Society	10 0 0	
,, British Colour Council	5 5 0	
,, London Children's Gardens	10 10 0	
,, Gardeners' Royal Benevolent Inst.	52 10 0	
,, Royal Gardeners' Orphan Fund	21 0 0	
,, Flowers and Plants Publicity Committee	26 5 0	
,, British Bee-Keepers' Association	5 5 0	
P. D. Williams Medal, Design and Dies	75 0 0	
Portrait W. T. Aiton.	10 0 0	
Pritzel Revision (Index Londinensis)	467 12 8	
		821 5 8
,, BOTANICAL MAGAZINE	464 1 2	
Add Work in Advance	249 0 0	
		713 1 2
Carried forward		£49,418 6 8

FOR THE YEAR ENDED 31st DECEMBER, 1937. Cr.

	£ s. d.	£ s. d.
By Annual Subscriptions		51,641 1 6
,, Dividends and Interest	1,299 0 1	
,, Do. Do. Davis Trust . .	43 17 10	
,, Deposit Interest	145 7 9	1,488 5 8
,, Hall Lettings, Gross		6,356 9 3
,, Life Compositions—		
Being amounts paid by Fellows who have died during the year		362 5 0
,, Rent of Freehold Property (Wisley) . .		285 14 8



Carried forward . . £60,133 16 1

Dr. **ANNUAL REVENUE & EXPENDITURE ACCOUNT**

	£ s. d.	£ s. d.	£ s. d.
Brought forward			49,418 6 8
To Examinations in Horticulture—			
Expenses		687 5 4	
Less Fees		643 9 0	
			43 16 4
„ General Scholarships		56 0 0	
Less Contributions from the Knott Scholarship Fund . . .	15 0 0		
Less Contributions from the Worshipful Company of Gardeners .	25 0 0		
		40 0 0	
			16 0 0
„ Old and New Halls Sinking Fund Appropriation			3,366 0 0
„ Restaurants—			
Deficit after charging Proportion of Overhead Expenses			537 11 0
„ Balance, being Excess of Revenue over Expenditure, carried to General Reserve . .			6,752 2 1
			£60,133 16 1

	£	s.	d.
Brought forward . .	60,133	16	1
	£60,133	16	1

LIABILITIES.

	£ s. d.	£ s. d.
Accumulated Funds Account		250,000 0 0
Life Compositions as at 31st December, 1936	14,982 15 0	
Less Fees paid by Fellows who have died during the year	362 5 0	
	14,620 10 0	
Add Life Compositions paid during the year	714 15 0	
		15,335 5 0
Sundry Creditors		3,917 10 5
Bank Overdraft		6,557 14 11
Subscriptions in Advance		761 12 11
Depreciation and Renewals Fund		10,000 0 0
Old and New Halls Sinking Fund	22,113 17 9	
Deducted *per Contra*	22,113 17 9	
Weather Insurance Fund		3,000 0 0
Supplementary Pension Fund		4,175 5 4
Dame Julia M. Tilden Legacy Suspense Account		500 0 0
Memorial and other Trust Funds—		
Balances in the hands of the Society as per Separate Schedule		341 2 7
General Reserve—		
Balance as at 31st December, 1936	21,467 1 2	
Add Appreciation on Sale and Reinvestment of General Investments	44 3 5	
Amount transferred from Depreciation and Renewals Fund	60 19 0	
Balance of Revenue and Expenditure Account, 31st December, 1937	6,752 2 1	
		28,324 5 8
		£322,912 16 10

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position of the Society on the 31st December, 1937. In the total of Assets, £322,912 16*s.* 10*d.*, are included Investments and Cash amounting in all to a total sum of £39,630 5*s.* 8*d.*, representing Depreciation and other Funds.

BALANCE SHEET, 31st DECEMBER, 1937.

ASSETS.

	£ s. d.	£ s. d.
OLD HALL, OFFICES, RESTAURANT, LIBRARY, AND EQUIPMENT AT COST	77,642 0 0	
NEW HALL, RESTAURANT AND EQUIPMENT AT COST	167,706 2 10	
	245,348 2 10	
Less Old and New Halls Sinking Fund *per contra*	22,113 17 9	223,234 5 1
OLD AND NEW HALLS SINKING FUND INVESTMENTS AT COST—		
As at 31st December, 1936	18,152 1 11	
Appreciation on Sale and Reinvestment	70 18 3	
Additions during the year	3,890 17 7	22,113 17 9
(Market value of Investments at 31st December, 1937, £21,344 1s. 7d.)		
FREEHOLD PROPERTY, WISLEY—		
As at 31st December, 1936	13,104 2 11	
Additions during the year	2,500 0 0	
	15,604 2 11	
Less written off	2,499 0 0	13,105 2 11
BOTANICAL MAGAZINE—		
Stock		100 0 0
DEPRECIATION AND RENEWALS FUND INVESTMENTS AT COST		10,000 0 0
(Market value of Investments at 31st December, 1937, £10,037 8s. 7d.)		
WEATHER INSURANCE FUND INVESTMENTS AT COST		3,000 0 0
(Market value of Investments at 31st December, 1937, £2,867 9s. 10d.)		
SUPPLEMENTARY PENSION FUND INVESTMENTS AT COST—		
As at 31st December, 1936	3,766 0 4	
Additions during the year	409 5 0	4,175 5 4
(Market value of Investments at 31st December, 1937, £4,015 11s. 9d.)		
DAME JULIA M. TILDEN LEGACY INVESTMENT AT COST.		500 0 0
(Market value of Investment at 31st December, 1937, £514 2s. 5d.)		
GENERAL INVESTMENTS AT COST:		
As at 31st December, 1936	25,067 18 11	
Appreciation on Sale and Reinvestment	44 3 5	
Additions during the year	16,717 7 7	
	41,829 9 11	
Add Amount transferred from Depreciation and Renewals Fund Investments	60 19 0	41,890 8 11
(Market value of Investments at 31st December, 1937, £40,999 1s. 3d.)		
WISLEY ADJUSTMENT ACCOUNT.		237 2 6
SUNDRY DEBTORS AND PAYMENTS IN ADVANCE		4,308 13 11
CASH AT BANK AND IN HAND		248 0 5
		£322,912 16 10

J. S. FEATHER, F.C.A., *Auditor*
(HARPER, FEATHER & PATERSON, *Chartered Accountants*),
35 Great Tower Street, London, E.C. 3.

4th January, 1938.

Dr. **WISLEY GARDENS—REVENUE & EXPENDITURE**

	£ s. d.	£ s. d.
To ESTABLISHMENT EXPENSES—		
Salaries and Wages	2,464 10 8	
Rates, Taxes and Insurance	411 11 1	
Miscellaneous, including Donations	1,181 4 2	
Annuities	91 0 0	
		4,148 5 11
,, LABORATORY AND SCHOOL OF HORTICULTURE—		
Salaries and Wages	2,637 9 2	
Miscellaneous	140 6 11	
Depreciation	60 5 6	
		2,838 1 7
,, GARDEN—		
Salaries and Wages	6,657 19 10	
Plant Distribution	950 0 5	
Miscellaneous	1,233 6 7	
Depreciation	323 15 5	
		9,165 2 3
,, STAFF PENSIONS	544 19 7	
Less Contributions by Staff, as per Scheme	272 10 0	
		272 9 7
		£16,423 19 4

To BALANCE, brought down		12,867 13 7
,, SPECIAL EXPENDITURE—		
Purchase of Land adjoining Battleston Hill written off	2,499 0 0	
Fencing New Land and Trial Grounds	258 13 4	
Water Supply, Battleston Hill	732 4 6	
Bothy alterations	115 4 0	
Hostel alterations	141 11 0	
Hostel Furniture	113 5 9	
Professional charges in connexion with Land Purchase and Buildings	304 15 4	
Electrification system (completion)	115 11 6	
Cultivator for Fruit Trials	171 8 9	
Electric Hedge Clipper	53 14 10	
Road Repairs	42 0 0	
		4,547 9 0
		£17,415 2 7

ACCOUNT FOR YEAR ENDED 31st DECEMBER, 1937. Cr.

	£ s. d.	£ s. d.
By DIVIDENDS AND INTEREST		1,050 2 4
,, CONTRIBUTIONS TO FRUIT TRIALS, 1936–37—		
Ministry of Agriculture	425 0 0	
Worshipful Company of Fruiterers . .	26 5 0	
National Farmers' Union	65 2 0	
		516 7 0
,, GARDEN—		
Sales and Miscellaneous Receipts . . .	1,059 8 3	
Prepaid Distribution Postages and Packing Fees	930 8 2	
		1,989 16 5
,, BALANCE, carried down		12,867 13 7
		£16,423 19 4

,, BALANCE, being Net Expenditure for year, carried to the Annual Revenue and Expenditure Account	17,415 2 7
	£17,415 2 7

LIABILITIES.

	£	s.	d.
Accumulated Funds Account	35,870	7	8
Vincent Square Adjustment Account	237	2	6
Endowment Trust Fund	24,479	14	3
Depreciation and Renewals Fund	8,935	7	0
	£69,522	11	5

SHEET, 31st DECEMBER, 1937.

ASSETS.

	£ s. d.	£ s. d.
LABORATORY, DWELLING HOUSES, GLASS HOUSES, RANGES, ETC., AT COST		33,371 10 10
N.B.—The Hanbury Trust Estate is, under the Trust Deed, vested in the Society only so long as it is in a position to use it as an Experimental Garden. Accordingly the Expenditure thereon by the Society is an Asset only so long as the Gardens continue to be used by the Society.		
FUEL STOCK (valued by the Director)		19 14 2
PLANT, LIVE STOCK AND LOOSE EFFECTS (valued by the Director)—		
As at 31st December, 1936	2,023 4 8	
Add Purchases during the year	47 11 0	
	2,070 15 8	
Less Depreciation of Garden and Laboratory Effects	134 0 11	
		1,936 14 9
LIBRARY—		
As at 31st December, 1936	728 5 4	
Additions during the year	51 5 1	
		779 10 5
ENDOWMENT TRUST FUND INVESTMENTS AT COST		
As at 31st December, 1936	24,419 11 1	
Appreciation on Sale and Reinvestment	60 3 2	
		24,479 14 3
(Market value of Investments at 31st December, 1937, £23,671 3s. 1*d.*)		
DEPRECIATION AND RENEWALS FUND INVESTMENTS AT COST—		
As at 31st December, 1936	8,648 3 8	
Appreciation on Sale and Reinvestment	37 3 4	
Additions during the year	250 0 0	
		8,935 7 0
(Market value of Investments at 31st December, 1937, £9,792 14s. 11*d.*)		
		£69,522 11 5

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position on the 31st December, 1937. In the total of Assets, £69,522 11s. 5*d.*, are included Investments, amounting to £33,415 1s. 3*d.*, representing Endowment and Depreciation Funds which are not available for the general purposes of the Society.

J. S. FEATHER, F.C.A., *Auditor*
(HARPER, FEATHER & PATERSON, *Chartered Accountants*),
35 Great Tower Street, London, E.C. 3.

4th January, 1938.

	Amount of Fund represented by Investments at Cost.				Income Balance in hand 31st Dec., 1936.		
	£	s.	d.		£	s.	d.
1. Alfred Davis Trust Fund	1,049	9	2			*nil*	
2. Williams Memorial Fund	*259	5	4		15	8	6
3. Masters Memorial Fund	542	17	0		122	5	10
4. Nicholson Memorial Fund	*202	2	2			*nil*	
5. Schröder Pension Fund	557	14	6		6	6	8
6. Lindley Library Trust	14,489	5	7	(a)		*nil*	
7. Sir James Knott Trust	600	0	0		87	6	3
8. Veitch Memorial Trust Fund	1,746	1	0		86	16	0
9. Moore Medal Trust	190	10	6		7	0	5
10. Sewell Medal Trust Fund	*531	8	9		4	14	7
11. Mrs. Sherman Hoyt Prize Fund	207	7	10		16	10	10
12. Lord Riddell Trophy Fund	222	12	11		2	12	7
13. Dedications Volume Fund (Botanical Magazine)	*214	8	9			*nil*	
14. The Colman Fund	1,183	15	3			*nil*	
15. P. D. Williams Fund	372	7	9		8	2	9

* Note.—The above Funds have been increased by the appreciation on Sale and Reinvestment of certain securities during the year.

Notes on above Funds:

1. Bequeathed to the Society in 1870 for annual prizes or any other object the Council may determine.

2. Raised by donations in 1891 in memory of the late Mr. B. S. Williams towards the provision of prizes and medals.

3. Raised by donations in 1908 in memory of the late Dr. Masters towards the provision of one or more annual lectures.

4. Raised by donations in 1908 in memory of the late Mr. Geo. Nicholson to provide prizes for Wisley students.

5. Provided by the Society in memory of the late Baron Schröder to pay to the Gardeners' Royal Benevolent Institution for one pension.

6. The nucleus of the library is the fine collection of books and pamphlets which belonged to the late Dr. Lindley. It has since been added to by the books purchased by the Society and by the gifts of the late Mr. Reginald Cory and of private donors.

7. Presented to the Society in 1920 by the late Sir James Knott for the purpose of providing a scholarship tenable at Wisley.

FUND ACCOUNTS, 31st DECEMBER, 1937.

Dividends and Interest received during 1937.			Expenditure in 1937 in accordance with the Trust.			Income Balance in hands of R.H.S. 31st Dec., 1937.		
£	s.	d.	£	s.	d.	£	s.	d.
43	17	10	43	17	10		*nil*	
8	7	10	10	5	4	13	11	0
20	0	0	20	0	0	122	5	10
2	12	2	2	12	2		*nil*	
20	0	0	20	0	0	6	6	8
661	18	2 (*b*)	661	18	2		*nil*	
25	3	0	15	0	0	97	9	3
57	17	2	82	15	0	61	18	2
7	16	6	9	17	10	4	19	1
21	15	1	24	17	6	1	12	2
10	8	1	6	17	6	20	1	5
5	19	0	7	4	6	1	7	1
6	3	7 (*c*)	6	3	7		*nil*	
30	15	3 (*d*)	30	15	3		*nil*	
11	0	5	7	11	3	11	11	11
Total as per Balance Sheet						£341	2	7

	£	s.	d.
(*a*) Investment . Cost of Books purchased by the Society up to 31st Dec., 1936	12,540	17	3
Books purchased by the Society in 1937 . .	438	18	2
	£14,489	5	7

(*b*) Includes contribution by the Society in 1937, £615 1*s.* 6*d.*
(*c*) Includes proceeds of sales in 1937, of £1. Invested and added to Fund.
(*d*) Invested and added to Fund.

8. Instituted in 1870 in commemoration of the late Mr. James Veitch for the encouragement of Horticulture. Fund vested in Society in 1922.

9. Presented to the Society in 1926 by the late Mr. G. F. Moore to provide a medal annually for the best new Cypripedium shown to the Society during the year.

10. Presented to the Society in 1928 by the late Mr. A. J. Sewell to provide medals for Rock Garden Plants.

11. Presented by Mrs. A. Sherman Hoyt in 1929 as a donation and funded by the Society to provide prizes for the encouragement of the growth of Cacti and Succulents.

12. Presented by the late Lord Riddell in 1931 to provide a trophy annually to be awarded for vegetables.

13. Proceeds of the sale of Curtis's Botanical Magazine Dedications, 1827–1927, presented in 1932 to the Society by the late Mr. William Cuthbertson, V.M.H., to be devoted to publications.

14. Presented to the Society in 1935 by Sir Jeremiah Colman, Bt., V.M.H., to be used for the improvement of flowers or fruit.

15. Raised in 1936 by donations to provide medals to commemorate the late Mr. P. D. Williams and to encourage the cultivation and improvement of Daffodils and Rhododendrons. In 1937 the Society made a grant of £75 to cover the cost of medal design and dies.

GENERAL MEETINGS.

NOVEMBER 9, 1937.

Lectures were given by Mr. E. A. BOWLES, F.L.S., V.M.H., Mr. E. A. BUNYARD, F.L.S., and Mr. H. R. DARLINGTON, F.L.S., on "The Gardener's Library" (p. 68).

FLOWER ARRANGEMENT COMPETITION.

First Prize a Silver Cup.
To Mrs. E. Hunter, 187 Queen's Gate, London, S.W. 7.

Second Prize £1 10s.
To Mrs. A. Stallard, 9 Royal Crescent, Bath.

Third Prize £1.
To Miss H. M. Baker, The Croft, Willingdon, Eastbourne.

The Society's Gold Medal.
To Mr. Frank Galsworthy, Chertsey, for an exhibit of water-colour paintings of Primulas and other plants.

Silver Grenfell Medal.
To Mr. A. G. Stubbs, Hove, for an exhibit of water-colour paintings of leaves and lichens.

Grenfell Medal.
To Mrs. A. Stallard, Bath, for an exhibit of oil paintings of plants from the Near East.

SCIENTIFIC COMMITTEE.—Mr. F. J. HANBURY, F.L.S., V.M.H., in the Chair, and four other members present.

The late Dr. Voelcker.—The death of Dr. Voelcker who had for many years been the Society's Consulting Chemist and a member of the Committee was reported and the Committee desired that an expression of sympathy should be sent to Mrs. Voelcker.

Flowers of Anagallis arvensis aberrant.—Dr. Barnes showed flowers of *Anagallis arvensis* with a much reduced corolla, much enlarged sepals, reduced stamens and a ribbed 5-partite ovary. The plant showed very similar abnormalities to those in the curious form of *Stellaria media* shown by him on a former occasion.

Woody protuberances on Eucalyptus Globulus.—A young plant of *Eucalyptus Globulus* with large buds near the base appearing as woody protuberances was shown.

Rooting of Eucryphia glutinosa.—Dr. Tincker showed illustrations of the effect of growth-promoting substances on cuttings of *Eucryphia glutinosa.*

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and thirteen other members present.

Exhibits.

The Director, John Innes Horticultural Institution, Mostyn Road, Merton Park, S.W. 19: seedling Apple No. 363.

Mr. J. Kirkham, Lime Grove, Forest Town, Mansfield: seedling Apple.

Mr. D. Morgan, 77 Carlyle Road, Lozells, Birmingham: seedling Apple.

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Brownlee's Russet,' 'Cox's Orange Pippin' and 'Peter Lock.'

Messrs. H. Simmonds and Sons, Chipperfield Nurseries, Kings Langley, Herts: seedling Apple.

Messrs. J. Stokes, Nurserymen, Trowbridge: Apple 'Archer.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:—

Gold Medal.

To J. Pierpont Morgan, Esq. (gr. Mr. F. A. Steward), Watford, for Begonias and foliage plants.

To Messrs. Sutton, Reading, for Cyclamens.

Silver Flora Medal.
To Messrs. Carter Page, London, for Dahlias.
To Messrs. John Peed, West Norwood, for Begonias.
To Messrs. Vinten, Balcombe, for Chrysanthemums.

Silver Banksian Medal.
To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Blackmore & Langdon, Bath, for Cyclamens.
To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.
To Mr. W. Wells, Junr., Merstham, for Chrysanthemums.

Banksian Medal.
To Messrs. Engelmann, Saffron Walden, for Carnations.
To Messrs. S. Low, Enfield, for Carnations.
To Messrs. Spencer, Hockley, for Dahlias.
To Swanley Horticultural College, Swanley, for Chrysanthemums.

The following award was recommended after trial at Wisley.

Award of Merit.
To *Streptocarpus* ' Merton Giant ' as a greenhouse pot plant, from the Director, John Innes Horticultural Institution, Merton Park.

Other Exhibits.
Messrs. Clark, Dover : hardy plants.
Mr. C. Hodges, Wadhurst : Chrysanthemum ' Mrs. C. Hodges.'
Misses Hopkins, Coulsdon : hardy plants.
Mr. A. H. Huggins, Englefield Green : Chrysanthemum ' Constance.'

FLORAL COMMITTEE B.—Mr. E. A. Bowles, M.A., F.L.S., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :—

Flora Medal.
To Mr. E. Ladhams, Elstead, for rock garden plants and shrubs.
To Messrs. Russell, Windlesham, for flowering and foliage shrubs.

Banksian Medal.
To Mr. J. Klinkert, Richmond, for clipped Box trees.
To Mr. L. Lawrence, Taplow, for succulents.
To Messrs. Southgate, New Malden, for succulents.

Preliminary Commendation.
To *Rhododendron* × *atro-rubrum* as a flowering shrub for the greenhouse (votes 7 for, 2 against), from Messrs. Russell, Windlesham.

Other Exhibits.
Messrs. Burkwood & Skipwith, Kingston : shrubs.
Messrs. Elliott, Stevenage : *Ornithogalum Saundersiae.*
C. J. Howlett, Esq., Reading : *Saxifraga Fortunei.*
Mr. E. Markham, Gravetye, East Grinstead : *Sarcococca ruscifolia, Berberis* ' Gravetye Seedling.'
Messrs. Russell, Windlesham : *Rhododendron* ' Ne Plus Ultra,' *R.* ' Exquisite.'
Messrs. Watson, Killiney : *Berberis* ' Watson's Ruby.'
Mr. R. Colpoys Wood, West Drayton : shrubs.

ORCHID COMMITTEE.—Sir Jeremiah Colman, Bart., in the Chair, and fifteen other members present.

Awards Recommended :—

Award of Merit.
To *Cymbidium* × ' Moirense ' var. ' Diana Broughton ' (*albanense* × ' Moira ') (votes 12 for), from Capt. the Hon. H. R. Broughton, Bakeham House, Englefield Green, Surrey. See p. 82.
To *Odontonia* × ' Carina ' (*Odontoglossum* × ' Camilla ' × *Odontonia* × ' Duchess of York ') (votes 12 for), from Messrs. Charlesworth, Haywards Heath. See p. 83.
To *Cypripedium* × ' Constance Flory ' var. ' Venus ' (' Doris Black ' × ' Symphony ') (votes 9 for, 4 against), from Messrs. Black & Flory, Slough. See p. 82.
To *Cypripedium* × ' Leonora ' var. ' Amaranth ' (' Cardinal Mercier ' × ' Golden Eagle ') (votes 13 for, 1 against), from Messrs. H. G. Alexander, Tetbury. See p. 82.
To *Cymbidium* × ' Amelia ' var. ' Solum ' (*albanense* × *erythrostylum*) (votes 12 for), from Messrs. McBean, Cooksbridge. See p. 82.

To *Brassolaeliocattleya* × ' Victoria ' var. *coerulea* (*B.-l.-c.* × ' Antoinette ' × *Cattleya* × ' Portia ') (votes unanimous), from Sir Jeremiah Colman, Bart., Gatton Park, Reigate. See p. 81.

To *Angraecum infundibulare*, Low's var. (votes unanimous), from Messrs. Stuart Low, Jarvis Brook. See p. 81.

Other Exhibits.

Sir Jeremiah Colman, Bart., Reigate : a group of Orchids.
Messrs. Charlesworth, Haywards Heath : a group of Orchids.
Messrs. Stuart Low, Jarvis Brook : a group of Orchids.
Messrs. McBean, Cooksbridge : a group of Orchids.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.— Mr. D. INGAMELLS in the Chair, and nine other members present.

Exhibit.

Carnation ' Eva ' (to be seen again), shown by The Farnham Royal Nurseries, Slough.

NOVEMBER 23, 1937.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—British Carnation Society's Show. Mr. G. MONRO, C.B.E., V.M.H., in the Chair, and nine other members present.

Exhibits.

Carnations ' Allwood's Primrose,' ' Puritan ' (to be seen again), ' Allwood's Cream ' (to be seen again), ' Marchioness of Headfort ' and ' Mellow Pink,' shown by Messrs. Allwood Bros., Haywards Heath, Sussex.

Carnation ' Frank,' shown by F. Lovering, Esq., Cheshunt.

Carnation ' Margaret of Stokesay,' shown by Mrs. Jewell, Allcroft, Onibury, Salop.

Carnations ' Beryl ' and ' Seedling No. 10,' shown by Mr. G. Simpson, The Royal Gardens, Windsor.

Carnation ' Rosie,' shown by Messrs. C. Engelmann, Saffron Walden, Essex.

Carnation ' White Fragrance,' shown by Messrs. Blackmore & Langdon of Bath.

Carnations ' T. B. Silcock ' (to be seen again), ' Fidelity ' (to be seen again), ' Bouquet ' and ' Mrs. Richard Bibby,' all shown by Messrs. Richard Bibby, Kelston Nursery, Little Singleton, near Blackpool.

NOVEMBER 30, 1937.

A lecture was given by Mr. A. N. RAWES on " New Apples."

Chairman : Mr. T. NEAME.

Silver-gilt Grenfell Medal.

To Mrs. Vera Higgins, Croydon, for an exhibit of water-colour paintings of Orchids, Succulents and bulbous plants.

Grenfell Medal.

To Miss E. Sartain, Telscombe Cliffs, for an exhibit of water-colour paintings of flowers.

To Lt.-Commander J. P. W. Furse, R.N., Smarden, for an exhibit of water-colour paintings of Crocuses.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

The late Dr. Voelcker.—It was reported that a letter of thanks, acknowledging the vote of sympathy with Mrs. Voelcker, had been received.

Fungus on peat moss.—Mr. Bowles showed a fungus growing on the surface of peat moss in pots, which was referred to Mr. Green for identification.

Germination of Pelargonium seeds.—Mr. Langley Smith sent a communication regarding his experience with the seeds of various species and hybrids (principally the latter) of Pelargonium. Viability lasted for some years but rapidly fell off after about seven, except in *P. zonale*, where it seemed to be limited to about three years.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Awards Recommended :—

Silver Hogg Medal.

To Mr. Howard H. Crane, Highmead, Cheney Lane, Eastcote, Pinner, for a collection of Apples.

Other Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone : Apple ' Orleans Reinette.'
Mr. H. J. Camden, 2 Ormond Road, Wantage : seedling Apple.
Mr. W. H. Divers, Westdean, Hook, nr. Surbiton : Apple ' Barnack Orange.'
Mr. H. H. Knight, Fruit Farm, Yaxham, E. Dereham : seedling Apple.
Messrs. Laxton, Bedford : Apples ' Laxton's Chieftain,' ' Laxton's Dictator,' ' Laxton's Jewel,' ' Laxton's Rover.'
Mr. E. Oliver, The Limes, Great Cornard, Sudbury, Suffolk : seedling Apple.
R.H.S. Commercial Fruit Trials, Wisley : Apple ' Thorpe's Peach.'
The Director, John Innes Horticultural Institute, Mostyn Road, Merton Park, S.W. 19 : seedling Apples Nos. 855 and 857.
Mr. B. Thompson, The Gardens, Burdcrop Park, nr. Swindon : seedling Apple.

FLORAL COMMITTEE A.—Mr. G. W. Leak, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.

Silver Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for Cyclamens.
To Messrs. Vinten, Balcombe, for Chrysanthemums.

Silver Banksian Medal.

To Messrs. Greenyer, Worthing, for Chrysanthemums.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Engelmann, Saffron Walden, for Carnations.
To Messrs. Jones, Whitchurch, for a group of *Primula obconica* ' Wyaston Wonder.'

Banksian Medal.

To Messrs. Buckwell, St. Mary Cray, for Chrysanthemums.
To Messrs. Napier, Taunton, for Carnations.
To Mr. W. Wells, Jun., Merstham, for Chrysanthemums.

Selected for trial at Wisley.

Primula obconica ' Wyaston Wonder,' from Messrs. Jones, Whitchurch, Hereford.

Other Exhibits.

Mr. W. J. Earl, Knowsley : Chrysanthemum ' George Wilson.'
H. Hooker, Esq., Freshwater Bay : Violets.
Misses Hopkins, Coulsdon : hardy plants.
S. R. Nightingale, Esq., Ormesby : Chrysanthemum seedling.

FLORAL COMMITTEE B.—Mr. C. T. Musgrave, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Flora Medal.

To Mr. E. Ladhams, Elstead, for dwarf shrubs and rock garden plants.

Banksian Medal.

To Mr. J. Klinkert, Richmond, for clipped Box trees.
To Messrs. Russell, Windlesham, for evergreen shrubs.
To Messrs. Southgate, New Malden, for succulents.

Award of Merit.

To *Salvia fulgens* as a hardy flowering plant (votes unanimous), from Mr. R. C. Notcutt, Woodbridge. This award was recommended, subject to naming, on November 9, 1937, and is now confirmed. See p. 83.

To *Gaultheria Wardii* as a hardy, ornamental-fruiting shrub (votes unanimous), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. This award was recommended, subject to naming, on November 7, 1933, and is now confirmed. See p. 83.

Other Exhibits.

Messrs. Clark, Dover : hardy shrubs.
Col. Stephenson R. Clarke, C.B., Haywards Heath : *Gaultheria tetramera.*
Mr. J. Henry, London, S.E. 1 : specimen plant of *Aspidistra elatior.*
Mr. L. Lawrence, Taplow : succulents.
Messrs. Neale, Worthing : succulents.
Mr. R. C. Notcutt, Woodbridge : *Pyrus Tschonoskii.*
Messrs. Russell, Windlesham : *Phormium tenax tricolor, Bougainvillaea* ' Orange King.'
Mr. R. Colpoys Wood, West Drayton : hardy shrubs.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and fourteen other members present.

Awards Recommended :—

First-class Certificate.

To *Cattleya* × ' Fred Sander ' var. ' Imperia ' (' Fabia ' × ' Remy Chollet ') (votes unanimous), from Messrs. Sanders, St. Albans. See p. 81.

Award of Merit.

To *Cypripedium* × ' Diana Broughton ' var. ' Diadem ' (' Doris Black ' × ' Grace Darling ') (votes 8 for, 4 against), from Capt. the Hon. H. R. Broughton, Bakeham House, Englefield Green. See p. 82.

To *Cymbidium* × ' Lucy ' var. ' Goldcrest ' (' Doris ' × ' Lucastes ') (votes 11 for), from the Hon. H. S. Tufton, Castle Hill, Englefield Green. See p. 82.

To *Brassolaeliocattleya* × ' Rosella ' (*B.-c.* × ' Rosita ' × *L.-c.* × ' Nella ') (votes unanimous), from Messrs. Stuart Low, Jarvis Brook. See p. 81.

To *Cymbidium* × ' Lucy ' var. ' Goldilocks ' (' Doris ' × ' Lucastes ') (votes 10 for, 4 against), from Messrs. McBean, Cooksbridge. See p. 82.

To *Cypripedium* × ' Sunset ' (' Earl of Chester ' × *Maudiae*) (votes 12 for), from Messrs. Sanders, St. Albans. See p. 83.

To *Odontoglossum* × ' Purple Crown ' (' Imperator ' × ' Purple Queen ') (votes 11 for), from Messrs. Charlesworth, Haywards Heath. See p. 83.

Other Exhibits.

Messrs. Armstrong & Brown, Tunbridge Wells : a group of Orchids.
Messrs. Stuart Low, Jarvis Brook : a group of Orchids.
Messrs. Charlesworth, Haywards Heath : a group of Orchids.
Messrs. McBean, Cooksbridge : a group of Orchids.
Messrs. H. G. Alexander, Tetbury : a group of Orchids.
Messrs. Sanders, St. Albans : a group of Orchids.
W. F. Higgins, Esq., Croydon : *Liparis viridiflora.*
Sir William Cooke, Bt., Newbury : *Cymbidium* × ' Penguin.'
M. L. Wells, Esq., Chiddingfold : *Laeliocattleya* × ' Theomus.'
N. M. Jensen, Esq., Roehampton : *Cypripedium* hybrids.

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and ten other members present.

Awards Recommended :—

Award of Merit.

To *Gentiana* × ' Glendevon ' as a flowering plant for the rock garden and alpine house (votes 7 for), from Andrew Harley, Esq., Kirkcaldy. This award was recommended, subject to naming, on September 29, 1937, and is now confirmed. See p. 83.

Preliminary Commendation.

To *Androcymbium punctatum* as a flowering plant for the cool house (votes unanimous), from Mrs. Vera Higgins, Croydon.

DECEMBER 14, 1937.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and four other members present.

Fungus on peat.—Mr. Green reported that the fungus on peat shown by Mr. Bowles at the last meeting was a species of Radulum, probably *Radulum quercinum* not parasitic on plants.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Exhibit.

R.H.S. Commercial Fruit Trials, Wisley : Apples ' Cornish Aromatic,' ' St. Cecilia.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Silver Flora Medal.

To the Duke of Richmond and Gordon (gr. Mr. S. Capon), Goodwood, for Begonias.

To Messrs. Vinten, Balcombe, for Chrysanthemums.

Silver Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations and *Euphorbia fulgens*.

To Messrs. Greenyer, Worthing, for Chrysanthemums.

Flora Medal.

To Messrs. S. Low, Enfield, for Carnations and other greenhouse plants.

To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.

To Messrs. Napier, Taunton, for Carnations.

Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

Award of Merit.

To Chrysanthemum ' Lilac Wonder ' for cutting and market (votes unanimous), from Messrs. Vinten, Balcombe. See p. 82.

The awards recommended to Chrysanthemum ' Favourite ' Sports on trial at Wisley were confirmed.

Other Exhibits.

Mr. W. H. Cole, Southampton : Chrysanthemums.

Messrs. Chaplin, Waltham Cross : Chrysanthemum ' Stella Star ' (to be seen again).

Mr. J. W. High, Ayr : Chrysanthemum ' Wattfield Favourite ' (to be seen again).

Messrs. Low, Enfield : *Bouvardia* ' Salmon Beauty.'

Messrs. Sapsford, Pevensey : Chrysanthemums.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Flora Medal.

To Mr. E. Ladhams, Elstead, for hardy shrubs.

To Mr. L. Lawrence, Taplow, for succulents.

Banksian Medal.

To Mr. J. Klinkert, Richmond, for clipped Box trees.

To Messrs. Russell, Windlesham, for hardy shrubs.

Other Exhibits.

Messrs. Russell, Windlesham : *Billbergia Forgetiana, B. Saundersii, Jacobinia chrysostephana.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and twelve other members present.

Awards Recommended :—

First-class Certificate.

To *Cypripedium* × ' Diana Broughton ' var. ' Alcestis ' (' Doris Black ' × ' Grace Darling ') (votes unanimous), from Capt. the Hon. H. R. Broughton, Bakeham House, Englefield Green. See p. 82 and fig. 1.

To *Brassolaeliocattleya* × ' Cupid ' × (*B.-l.-c.* × ' Golden Queen ' × *C.* × ' Bellona ') (votes 9 for), from Messrs. McBean, Cooksbridge, Sussex. See p. 81.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group of Orchids.

Messrs. Sanders, St. Albans : a group of Orchids.

Messrs. Stuart Low, Jarvis Brook : a group of Orchids.

Messrs. McBean, Cooksbridge : a group of Orchids.

Messrs. Black & Flory, Slough : a group of Orchids.

Messrs. A. J. Keeling, Bradford : a group of Orchids.

Sir William Cooke, Bart., Hampstead Norris : *Cypripedium* hybrids.

M. L. Wells, Esq., Chiddingfold : *Cypripedium* hybrids.

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and six other members present.

Exhibits.

Mrs. G. Anley, Woking : *Nandina domestica nana, N. domestica purpurea nana.*

BOOKS ADDED TO THE LIBRARY, 1936.

(*Continued from November* 1937, *p. clxxxiv.*)

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(*To be continued.*)

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

JANUARY 11, 1938.

CYPRIPEDIUM TROPHY COMPETITION.

The Cypripedium Trophy for the best exhibit of twenty-five plants of Cypripedium, species and/or hybrids, shown by an amateur was awarded to M. L. Wells, Esq., Chiddingfold, Surrey. (Gardener: Mr. R. Buckman.)

Pictures, etc.

Silver Grenfell Medal.

To Lieut.-Commander J. P. W. Furse, R.N., Smarden, Kent, for an exhibit of water-colour drawings of Narcissi.

To Mr. A. G. Stubbs, Hove, Sussex, for an exhibit of water-colour paintings of British plants.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and ten other members present.

Nut for identification.—Dr. Tincker reported that the Nut shown at the last meeting was probably a Kola Nut. It had been found on a lawn, but its origin was unknown.

Colchicum sp.—Mr. R. D. Trotter showed a pinkish-mauve Colchicum, which proved to be the coloured form of *C. hungaricum*, and Mr. Impey sent a more globular-flowered plant which he had collected on Mt. Kelmos and which agreed with the description of *C. Catacuzenium*.

Gladiolus psittacinus.—Mr. Barnard of Wareham sent flowering plants of *G. psittacinus* which he said were not quite typical of the species. In the experience of members present it is a variable one. Mr. Barnard said that the plant was cultivated at the Cape in considerable quantities for cutting.

Effect of plant-hormones on Chrysanthemum flowers.—Flowers of Chrysanthemum White Favourite, some of which had been sprayed in the bud stage with a solution of Hortomone A., some left unsprayed, were sent by Mr. T. C. Laws of Rickmansworth. All the buds sprayed had produced incurved flowers which even after three weeks (without further spraying) had remained incurved; the remainder had produced flowers of the usual form.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and fourteen other members present.

Awards Recommended:—

Silver-gilt Hogg Medal.

To Messrs. Bunyard, Maidstone, for collection of Apples and Pears.

Silver Hogg Medal.

To Messrs. Cheal, Crawley, Sussex, for collection of Apples.

Other Exhibits.

Mr. E. A. Bunyard, Maidstone, Kent: Apple 'Golden Delicious.'

Mr. Howard H. Crane, Highmead, Eastcote, Middlesex: Apples 'Adams Pearmain' and 'American Mother.'

Mr. R. H. Hall, The Gardens, Hatfield House, Hatfield, St. Albans: Apple 'King George V' and Pear 'Olivier de Serres.'

Mr. H. Jones, 7 Albert Road, Epsom: Apple 'Jones' Seedling.'

Mr. W. C. Modral, The Gardens, Old Warden Park, Biggleswade: Apples 'Adams' Pearmain,' 'Blenheim Orange' and 'Easter Orange.'

Mr. F. Pope, Barkham Ride, Wokingham: Apple 'William Pope.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Laxton's Superb' and 'Winter King.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Engelmann, Saffron Walden, for Carnations and *Euphorbia fulgens.*

Banksian Medal.

To Messrs. Low, Enfield, for Carnations.

To Messrs. Vinten, Balcombe, for Chrysanthemums.

To Messrs. Wakeley, London, for Hyacinths.

Selected for trial at Wisley.

Primula sinensis stellata 'Beacon' from Messrs. Sutton, Reading.

Primula stellata 'Vivid' from Messrs. Brooks, Worting, Basingstoke.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Flora Medal.

To Mr. E. Ladhams, Elstead, for rock garden plants and shrubs.

To Messrs. Stuart Low, Enfield, for Camellias and other shrubs.

Banksian Medal.

To Alpine Nurseries, West Moors, for rock garden plants.

To Messrs. Cheal, Crawley, for flowering and evergreen shrubs.

To Mr. J. Klinkert, Richmond, for clipped trees.

To Mr. L. Lawrence, Taplow, for succulents.

To Messrs. Redgrove & Patrick, Sevenoaks, for Hellebores.

To Messrs. Russell, Windlesham, for Hamamelis and other shrubs.

Other Exhibits.

T. T. Barnard, Esq., Wareham: *Gladiolus psittacinus.*

Messrs. Barr, Taplow: bulbous plants.

Brookside Nurseries, Oxford: rock garden plants.

Messrs. Clark, Dover: shrubs.

S. G. Fiedler, Esq., Claygate: *Crassula portulacea.*

Miss Hopkins, Coulsdon: rock garden plants.

L. A. Impey, Esq., Chipping Norton: *Colchicum Cataeuzenium.*

Messrs. Neale, Worthing: succulents.

Messrs. Russell, Windlesham: *Rajeria caudata.*

Messrs. Stewart, Ferndown: bulbous plants and shrubs.

Mr. R. Colpoys Wood, West Drayton: conifers.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and nineteen other members present.

Awards Recommended:—

Gold Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group of Cypripediums.

Silver-gilt Banksian Medal.

To Guy P. Harben, Esq., King's Somborne, Hants, for a group of Orchids.

To Messrs. H. G. Alexander, Tetbury, for a group of Cypripediums.

Silver Flora Medal.

To Messrs. Sanders, St. Albans, for a group of Orchids.

Silver Banksian Medal.

To Messrs. Black & Flory, Slough, for a group of Cypripediums.

To Messrs. McBean, Cooksbridge, for a group of Orchids.

To Messrs. Charlesworth, Haywards Heath, for a group of Orchids.

Banksian Medal.

To Messrs. Stuart Low, Jarvis Brook, for a group of Orchids.

To Messrs. A. J. Keeling, Bradford, for a group of Cypripediums.

To A. M. Gentle, Esq., St. Albans, for a group of Orchids.

First-class Certificate.

To *Sophrolaeliocattleya* × 'Anzac,' Orchidhurst var. (*L.-c.* × *Dominiana* × *S.-l.-c.* × 'Carminetta') (votes 19 for), from Messrs. Armstrong & Brown, Tunbridge Wells. See p. 138.

Award of Merit.

To *Miltonia* × 'Melina' ('Memoria H. T. Pitt' × 'Mrs. J. B. Crum') (votes 14 for, 3 against), from Messrs. McBean, Cooksbridge. See p. 138.

Preliminary Commendation.

To *Odontoglossum* × 'Amphion' ('Alvara' × 'Purple Queen') (votes unanimous), from Messrs. Armstrong & Brown, Tunbridge Wells.

Cultural Commendation.

To Mr. E. Humphries, gardener to R. Cartwright, Esq., Aynho Park, Banbury, for *Laelia anceps*, a large plant with numerous flowers.

To Messrs. Sanders, St. Albans, for *Cymbidium* × 'Sunset,' bearing nine many-flowered spikes.

Other Exhibits.

Messrs. H. Dixon, Wandsworth: a group of Orchids.

W. F. Higgins, Esq., Croydon: *Dendrobium compactum.*

E. Kenneth Wilson, Esq., Wimbledon: *Cymbidium* × 'Adelma.'

Bertram C. Wood, Esq., Banbury: *Maxillaria picta.*

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, F.L.S., in the Chair, and eight other members present.

Exhibits.

Dr. P. L. Giuseppi, Felixstowe: *Narcissus Bulbocodium monophyllus foliosus, N. Bulbocodium Romieuxii.*

JANUARY 25, 1938.

A lecture was given by Miss D. M. CAYLEY on "Mushrooms." Chairman, Dr. W. F. BEWLEY, C.B.E., D.Sc.

Pictures, etc.

Silver-gilt Grenfell Medal.

To Lieut.-Commander J. P. W. Furse, R.N., Smarden, Kent, for an exhibit of water-colour paintings of Terrestrial Orchids.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and six other members present.

The late Dr. Rendle.—The loss which the Committee had sustained by the death of its Vice-Chairman, Dr. A. B. Rendle, was announced, and the Committee unanimously desired that an expression of sympathy should be sent to his relatives.

Curious growth of Potato.—Mr. Robinson showed a potato which had been kept in a rather dry place over two seasons. It had produced many much-branched short-jointed sprouts, and from them in a moist warm house arose very numerous thin shoots bearing small leaves about ¼ inch long.

Fuchsia aberrant.—He also showed a Fuchsia flower with two opposite sepals foliose.

Insects captured on flower stalks.—Mr. G. F. Wilson showed a photograph of *Rhododendron Thomsonii* with numerous small insects captured on the sticky flower stalks, and a photograph of a tomato stem on which Egyptian ants had been similarly captured.

Fruit of Stephanotis.—A ripe fruit of *Stephanotis floribunda* (which had taken two years to develop and mature) was shown by Mr. H. E. Stapley of 9 Kingsdown Avenue, South Croydon.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and nine other members present.

Award Recommended:—

Silver Knightian Medal.

To Messrs. Sutton, Reading, for a collection of Vegetables.

Other Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Welsh Onion 'Nebuka.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Lord Hindlip' and 'Heusgen's Golden Reinette.'

Mr. J. M. Richards, The Gardens, Gatton Park, Reigate, Surrey: Apple 'D'Arcy Spice.'

Mr. R. B. Rogers, Hexworthy, Launceston, Cornwall: Apple 'Hexworthy Seedling.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Gold Medal.

To Messrs. Blackmore & Langdon, Bath, for Cyclamen.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Carters' Tested Seeds, Raynes Park, for Primulas.

Flora Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations and *Euphorbia fulgens*.

To Messrs. Napier, Taunton, for Carnations.

Banksian Medal.

To Ashington Nurseries, Ashington, for Carnations.

To Messrs. Low, Enfield, for Carnations.

To Messrs. Wakeley, London, for Hyacinths.

Selected for trial at Wisley.

Cyclamen 'Albatross' from Messrs. Blackmore & Langdon, Bath.

Other Exhibit.

Messrs. Jones, Whitchurch: Primulas.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Cheal, Crawley, for Hamamelis and other flowering shrubs.

To Messrs. Hillier, Winchester, for Hamamelis, Camellias and other shrubs.

To Messrs. Russell, Windlesham, for Hamamelis and other flowering shrubs.

Flora Medal.

To Hocker Edge Gardens, Cranbrook, for bulbous plants in pans.

To Knap Hill Nursery Co., Woking, for Hamamelis and other shrubs.

To Mr. E. Ladhams, Elstead, for rock garden plants and shrubs.

To Messrs. Prichard, Christchurch, for rock garden plants and shrubs.

Banksian Medal.

To Alpine Nurseries, West Moors, for rock garden plants.

To Messrs. Barr, Taplow, for bulbous plants.

To Brookside Nurseries, Oxford, for alpine plants.

To Messrs. Cheal, Crawley, for rock garden plants.

To Mr. J. Klinkert, Richmond, for clipped trees.

To Mr. L. Lawrence, Taplow, for succulents.

To Messrs. Stuart Low, Enfield, for Camellias and other shrubs.

To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.

To Messrs. Neale, Worthing, for succulents.

To Messrs. Stewart, Ferndown, for rock garden plants and shrubs.

To Messrs. Waterer, Twyford, for rock garden plants.

To Messrs. Wood, Taplow, for rock garden plants.

Other Exhibits.

Mrs. Blathwayt, West Porlock: *Salvia blepharophylla*?

Messrs. Burkwood & Skipwith, Kingston: rock garden plants and shrubs.

Messrs. Clark, Dover: shrubs.

Miss Hopkins, Coulsdon: rock garden plants.

The Hon. Mrs. Ryder, Beaulieu: Cotoneaster.

Messrs. Southgate, New Malden: succulents.

Mr. R. Colpoys Wood, West Drayton: shrubs.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and thirteen other members present.

Awards Recommended:—

Award of Merit.

To *Brassocattleya* × *Vilmoriniana* var. 'Zeecrabbe' (*B.-c.* × 'Mrs. J. Leemann' × *C. Mossiae*) (votes 11 for, 1 against), from Messrs. Sanders, St. Albans.

See p. 138.

To *Odontoglossum* × 'Princess Juliana' ('Palmyras Queen' × 'Purple Emperor') (votes 10 for, 1 against), from Messrs. Charlesworth, Haywards Heath. See p. 138.

Preliminary Commendation.

To *Odontoglossum* × 'Hellespont' ('Leander' × 'President Hoover') (votes unanimous), from Messrs. Sanders, St. Albans.

Other Exhibits.

Messrs. Sanders, St. Albans: a group of Orchids.
Messrs. Charlesworth, Haywards Heath: a group of Orchids.
Messrs. McBean, Cooksbridge: a group of Orchids.
Messrs. Armstrong & Brown, Tunbridge Wells: a group of Orchids.
Messrs. Stuart Low, Jarvis Brook: a group of Orchids.
Sir William Cooke, Bart., Hampstead Norris: *Ornithidium Sophronitis*.

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, F.L.S., in the Chair, and eleven other members present.

Award Recommended:—

Award of Merit.

To *Narcissus Bulbocodium Romieuxii* as a flowering plant for the alpine house (votes 7 for, 1 against), from Major F. C. Stern, Goring-by-Sea. See p. 138.

Other Exhibits.

Mrs. Robert Lukin, Mortimer, Berks: *Asphodelus acaulis*.
Frank Barker, Esq., Stevenage, Herts: *Primula Allionii praecox*.

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(*Continued from p. xxxii.*)

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Wise, Henry. *Ed.* *See* GENTIL, F., & LIGER, L. The retir'd gard'ner.

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Witasek, Johanna. Ein Beitrag zur Kenntnis der Gattung *Campanula*. (Abhandl. zool.-bot. Ges. Wien, i.) Maps. 8vo. Vienna, 1902. (2)

Withous, Peter. *Illus.* *See* [DRAWINGS, COLOURED . . . on vellum].

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Wodehouse, Roger Philip. Pollen grains; their structure, identification and significance in science and medicine. Illus. 8vo. New York, 1935. (2)

Wolley-Dod, Anthony H. *See* BOLUS, H. List of flowering plants . . . of the Cape. 1903.

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Zammit, Salvino J. The cultivation of flowering bulbs and roots in the Maltese Islands. 8vo. [Malta, 1936.] (3)

Zederbauer, Emmerich. Handbuch des Obstbaues. Illus. 8vo. Vienna & Leipzig, 1936. (2)

Zetterstedt, Johan Emanuel. Plantes vasculaires des Pyrénées principales. 8vo. Paris, 1857. (2)

Zirkle, Conway. The beginnings of plant hybridization. Illus. 8vo. Philadelphia, 1935. (2)

DONATIONS TO THE SOCIETY'S GARDENS AT WISLEY, 1937.

ABERCONWAY, Lord, Bodnant, N. Wales; collection of Rhododendrons for Battlestone Hill; plants of *Camellia saluenensis*. AHRENDT, Rev. L. W. A., Stonefield, Watlington, Oxford; cuttings of Berberis; plant of *Berberis leucocarpa*. ALGIERS, UNIVERSITY BOTANIC GARDEN; seeds of shrubs. ALMA-ATA BOTANIC GARDEN, Kazakstan, U.S.S.R.; seeds of rock plants. ANDERSON, E. B., Loudwater, Rickmansworth; seedlings of *Roettlera Forrestii*. ANDERSON, S., Par, Cornwall; cuttings of *Camellia Sasanqua* var. ANLEY, Mrs. G., ch Hill, Woking; plant of *Lithospermum rosmarinifolium*. ARMITAGE, Miss, lnor, Ross; plant of pale variety of *Viola odorata*. ARNOLD ARBORETUM, laica Plain, Mass., U.S.A.; collection of tree and shrub seeds. BAGGESEN'S RSERIES, Messrs., Pembury, Tunbridge Wells; collection of seedling shrubs. HR, A. W., Oatlands Park, Weybridge; seeds of white Persian Cucumber. LWARD, G., South Ascot; plant of *Bougainvillaea*. BAKER, G. P., Kippington, enoaks; seeds of Cretan form of *Ranunculus asiaticus*. BAKER, Mrs. H. C., londsbury, Bristol; cuttings of *Cephalotaxus Fortunei*. BALLS, E. K., cian Expedition (per Royal Botanic Garden, Edinburgh); collections of its, bulbs and seeds. BANKS, G. H., Botanic Garden, Glasgow; cuttings of *Maesa indica*. BARSTOW, Major-Gen. H., Crondall, Hants; plants of *Amphicome arguta*. BECKTON, Miss G. L., Old Woking; seeds from Kashmir. BEES, Messrs., Chester; bulbs of *Lilium pardalinum* var. BENTON, P. L., Llandaff, Cardiff; seeds of *Rhodothamnus Chamaecistus*. BERESFORD, Lt.-Col. H. PACK-, Golden Square, W. 1; seeds of *Rhododendron* hybrids; plants of *Achimenes coccinea*. BERGIAN BOTANIC GARDENS, Sweden; collection of seeds. BERKELEY, R. G., Spetchley Park, Worcester; collection of seeds; plants of *Rosa* × *Hardii* and *Iris cuprea*. BERLIN-DAHLEM BOTANIC GARDEN; collection of seeds. BERMUDA, DEPT. OF AGRICULTURE; seeds of *Sisyrinchium bermudianum*. BETTY, Mrs. K., Seaford, Sussex; plants from Norway and S. Africa. BLATHWAYT, Mrs. G. W., West Porlock, Somerset; plant of *Bomarea Werchlei*. BOND, W. L., Addis Ababa, Abyssinia; seeds of Abyssinian plants. BOOTH, F. H. A., Chiddingfold; collection of plants for rock garden. BOOTHMAN, H. S., Maidenhead; seeds of rock plants. BOWLES, E. A., Enfield, Middx.; cuttings of *Buxus* varieties; plant of *Pachyphragma macrophyllum*. BOYCE THOMPSON, South Western Arboretum, Arizona; seeds of *Ceanothus* and *Mahonia* sp. BRIERLEY, M. H., Cobham, Surrey; plant of *Tolmiea Menziesii*. BRITTON, Miss E. A., Tiverton, Devon; collections of plants for the rock garden. BROOKE, Miss; collection of seeds from S. Africa. BROWN, G., Pyrford, Surrey; plants of *Diervilla* 'Eva Rathke.' BUCKNALL, Mrs., Doneraile, Co. Cork; bulbs of *Hippeastrum pratense*. BUCKWORTH, Mrs., Weybridge; seeds of *Kennedya* sp. from Jerusalem. BULLEY, A. K., Neston, Cheshire; plant of *Primula Clarkei*. BUNYARD, E. A., Maidstone; collection of herbs; seeds of *Lunaria rediviva*. BUTLER, Mrs. M., Cobham, Surrey; plants of *Rhododendron ponticum* for Battlestone Hill. BUTT, W., Chalford, Glos.; plants of *Eremurus Elwesianus*. BUTTON, C., Cranham, Essex; seeds of Tropical African plants. BYNG OF VIMY, Viscountess, Thorpe-le-Soken, Essex; seeds of *Aconitum septentrionale*. CAHEN, L., Marlow, Bucks; collection of seeds; cuttings of *Capparis spinosa*. CAMBRIDGE, UNIVERSITY BOTANIC GARDEN; collection of seeds. CANADA, DOMINION EXPERIMENTAL FARM, Ottawa; plants of hybrid *Malus* and *Syringa*. CARTER, Mrs., Wimbledon, S.W.; bulb collected in Peru. CARTERS TESTED SEEDS, LTD., Messrs., Raynes Park, S.W. 20; collection of seeds of *Eucalyptus* sp. and herbs. CHAMBERLAIN, W. S., Hampton-on-Thames; seeds of *Rosa persica*. CHARRINGTON, E., Limpsfield, Surrey; seeds of *Tigridia Pavonia*. CHRISTCHURCH BOTANIC GARDEN, N.Z.; collection of seeds; CLARKE, Col. STEPHENSON R., Haywards Heath, Sussex; plants of *Quercus falcata* and *Sassafras officinale*. CLAYTON, Miss, Henfield, Sussex; plants of *Bauhinia*, *Haemanthus*, and *Weinmannia*. CLUTTERBUCK, Sir P., Srinagar, Kashmir; seeds of *Cedrus Deodara* var. and *Tulipa* sp. COLOMB, Lt.-Comm. P. H. F., H.M.S. Vernon, Portsmouth; seeds of *Anigosanthus Manglesii*. CORREVON ET FILS, Chene-Bourg, Geneva; collections of seeds and plants for the rock garden. COWAN, Dr. J. M., Royal Botanic Garden, Edinburgh; collection of tree and shrub seeds from W. China. CRANE, Dr. F. D., Winter Park, Florida; seeds of various shrubs. CRANE, M. B., John Innes Hort. Inst., Merton, S.W.; plants of seedling Raspberry. CRANSTON, W., Melrose, Scotland; plants of Strawberry 'Improved Sir J. Paxton.' CRICHTON-MAITLAND, Mrs., Bourne, Lincs; buds of *Malus ioensis plena*. CROOK, R.; seeds of British Orchids. CROSFIELD, J. J., Embley Park, Romsey; plants of *Berberis hypokerina*, *Rhododendron Beanianum* and *R.*

calciphilum. CULVERWELL, Mrs. A. F.; plant of *Sterculia* sp. DALRYMPLE, B. H., Minstead, Lyndhurst; seeds of *Cytisus grandiflorus*; plants of *Gaultheria* and *Rhododendron*. DALRYMPLE, G. H., Bartley, Southampton; plants of *Gentiana sino-ornata*; buds of *Prunus yedoensis forma*. DESBOROUGH, Capt. A. P. M., Broadstone, Dorset; plants of various shrubs; collection of *Camellia* cuttings; seeds of Himalayan Lily. DICKINSON, Miss K., St. Albans; collection of four old Roses. DOBBIN, Mrs. M. A., Faladam, Blackshiels, Scotland; collection of seeds; roots of *Lathyrus tuberosus*. DOMAINE DES BARRES, Nogent-sur-Vernisson, France; collection of tree and shrub seeds. DOYNE, Mrs., Towcester, Northants; seeds of *Ainsliaea aptera*. DUKE, J., Bishop's Waltham, Southampton; seeds of yellow Lupin. DUNCAN, G. A., Isleworth, Middx.; seeds and plants for rock garden. DUNEDIN BOTANIC GARDEN, N.Z.; collection of *Celmisia* and other seeds. DUNN, Capt., Majorca (per F. J. Chittenden); corms of *Antholyza aethiopica* and *Gladiolus tristis*. DUNSTON, Capt. A., Donhead St. Mary, Wilts; seeds of *Solanum ferox*. DURHAM, F. R., Vincent Square, S.W. 1; seeds of *Juniperus* sp. from Fraser Valley. EDINBURGH, ROYAL BOTANIC GARDEN; collections of seeds of shrubs and rock plants; plants of *Primula, Sorbus*, etc.; cuttings of Heathers; seeds and bulbs collected by E. K. Balls and F. S. Smythe. ELLIOTT, CLARENCE, Stevenage; plants of *Fabiana imbricata violacea, Lavandula Spica rosea*; *Mahonia lomariifolia*. ENGELMANN, C., Saffron Walden; plants of Pansies and *Gerbera Jamesonii plena*. FERNIE, W. J., Bursledon, Hants; collection of seeds from the Andes. FINDLAY, H., Cobham, Surrey; seedlings of *Ranunculus asiaticus*; seeds of *Ranunculus, Verbena bonariensis, Populus lasiocarpa*; cuttings of *Berberis acuminata*. FINDLAY, R., Wisley; plants of *Magnolia Wilsonii*. FORSYTH, H. G., Botanic Gardens, Pietermaritzburg, Natal; corms of *Gladiolus* and *Watsonia*; roots of *Sandersonia*; *Mystacidium*. FOSTER, Sir V., Ardee, Co. Louth; seedlings of "Day-Lily" from India; FOSTER-MELLIAR, R. A., Bude, Cornwall; seeds of "Mamao" from Chile. FOX, Mrs. H. M., Peekskill, New York, U.S.A.; plants and seeds of *Lonicera flava*. FULLERTON, Mrs. A., Godalming; collection of plants, chiefly shrubs. GALSWORTHY, F., Chertsey; cuttings of *Abies, Rosa*, and *Salix*. GARDENER, E. H., Midford, near Bath; collection of seeds from W. China. GARDNER, H. C., Claygate, Surrey; canes of Raspberry. GARDNER, Hon. Mrs. A., Worplesdon; seeds of *Citrus japonicus*; plants of *Machaeranthera tanacetifolia*. GAUT, R. C., Worcester; grafts of Plum 'Blaisdon Red' and of Apple 'King Coffee'; canes of seedling Raspberry. GENEVA BOTANIC GARDEN, Switzerland; collections of seeds, chiefly of rock plants. GIUSEPPI, Dr. P. L., Felixstowe; seeds of *Campanula Formanekiana*. GLASNEVIN BOTANIC GARDEN, Dublin; seeds of trees, shrubs, and rock plants. GLEED, C. J., Winchester; plants of seedling Strawberry. GLOVER, A., Purley, Surrey; plant of *Primula Bulleyana* hybrid. GOLDING, Mrs. Y., Southern Rhodesia; seeds of *Gloriosa* sp. GORDON, Mrs. L., Farnborough, Hants; seeds of South African plant. GOTHENBURG BOTANIC GARDEN; collection of seeds. GOULD, B. J., Sikkim; collection of seeds. GOULD, G. W., Nottingham; seeds of *Androsace* and other rock plants. GOULD, N. K., West Byfleet; cuttings of *Teucrium fruticans*. GREEN, D. E., Send Marsh, Woking; plants of Strawberry 'Royal Sovereign.' GREY, Countess, Alnwick, Northumberland; seeds of *Primula sonchifolia*. GROVE, A., Richmond, Surrey; seeds of *Anemonopsis macrophylla*. HALAHAN, Miss, Chiddingfold, Surrey; plant of *Datura fastuosa* var. HALL, Mrs., Hordle, near Lymington; seeds of *Amaryllis Belladonna multiflora*. HALL, Rev. B., Lavenham, Suffolk; plant of double red Primrose. HAMILTON, Mrs., Pyrford, Woking; seeds of rock plants. HANBURY, F. J., East Grinstead, Sussex; seeds from the Himalayas. HANBURY, Sir C., Ventimiglia, Italy; collection of shrub seeds. HARLEY, A., Kirkcaldy, Scotland; seeds of *Meconopsis* and other plants; plant of *Gentiana* × 'Glendevon.' HARRAWAY, T. H., Warminster, Wilts; plants of seedling Raspberry. HASKINS, Messrs., Bournemouth West; collection of *Clematis* plants. HAWKER, H. G., Ermington, Devon; plants of three species of *Hedychium*. HAWKINS, L., Elstree, Herts; species of *Artemisia* and other plants for rock garden. HAY, C. A., Hindhead, Surrey; plant from Mexico, probably *Duranta Plumieri*. HAY, T., Hyde Park, London, W.; plant of *Malva umbellata*. HEINEMANN, F. C., Erfurt, Germany; seeds of Alpine Strawberry 'Baron Solemacher.' HENDERSON, C. W., East Croydon; seeds of *Salvia splendens alba*. HENGST, Mrs. A., California, U.S.A.; bulbs of *Calochortus*. HILLING, Messrs. T., Chobham, Surrey; collection of rock plants. HINDLEY, G. E., Woking; cuttings of *Grevillea* and *Pileostegia*; plant of *Ochna* sp. HOLDING, J., Evesham; plant of double red Sweet William. HOLMES, W. G., Tain, Scotland; seeds of Parsley 'Wuschelkopf.' HORSFALL, R. E., Seale, Farnham, Surrey; collection of Rhododendrons for Battlestone Hill.

(*To be continued.*)

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

FEBRUARY 8, 1938.

Silver Grenfell Medal.

To Mrs. C. Maxwell, Wimbledon Common, for an exhibit of water-colour paintings of flowers.

To Mr. A. G. Stubbs, Hove, Sussex, for an exhibit of drawings of British trees in spring.

Grenfell Medal.

To Lieut.-Commander J. P. W. Furse, R.N., Smarden, Kent, for an exhibit of water-colour paintings of Erythroniums.

A lecture was given by Mr. G. W. Robinson on " New Introductions for the Rock Garden."

Chairman, Major F. C. STERN, O.B.E., M.C., F.L.S.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Primula marginata fasciated.—A plant of *Primula marginata* with the main stem fasciated and with a cluster of rosettes near the apex was shown.

Plants referred from the Rock Garden Committee were identified as *Romulea nivalis* and *Colchicum libanoticum*, both collected by Mr. G. P. Baker.

Guizotia abyssinica, identified by Mr. E. G. Baker later, which had come up in Mr. Millard's garden at Tunbridge Wells, a plant bearing some resemblance to *Bidens cernua*, was shown, and also

Erlangea incana, a greenhouse plant with grey foliage and pale mauve flowers from Central Africa, also identified by Mr. E. G. Baker, figured in the Botanical Magazine, t. 8269, and frequently grown as *E. tomentosa*.

The late Dr. Rendle.—A letter of thanks was read from Miss Rendle acknowledging the sympathy of the Committee.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twelve other members present.

Exhibits.

Mr. H. Barnett, Westwood House, Tilehurst, Berks: Apple ' Rushock Pearmain ' and Medlar Jelly.

Mr. W. S. Cooper, Haverstock, Althorne, Essex: Seedling Apple.

Mr. Howard H. Crane, Highmead, Cheney Lane, Eastcote, nr. Pinner: Pear ' Catillac.'

Imperial Fruit Show, Ltd.: Samples of fruit from the South African and Palestine Fruits in Season Exhibit.

R.H.S. Commercial Fruit Trials: Apples ' Brownlee's Russet ' and ' Woolbrook Russet.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Blackmore & Langdon, Bath, for Cyclamens.

Flora Medal.

To Ashington Nurseries, Ashington, for Carnations.

To Messrs. Bath, Wisbech, for Daffodils, Tulips, Crocuses, etc.

To Captain G. S. Brocklebank (gr. Mr. J. T. Boulton), Flimwell, for *Primula malacoides*.

To Messrs. Carters Tested Seeds, Raynes Park, for *Primula malacoides* 'Duchess of Kent.'

To Messrs. Engelmann, Saffron Walden, for Carnations, and *Euphorbia fulgens*.

Banksian Medal.

To Messrs. Dobbie, Edinburgh, for Crocuses.

To Mr. F. Everitt, Enfield Lock, for Primulas, Clivias, Cyclamen, etc.

To Messrs. S. Low, Enfield, for Carnations.

To Messrs. Napier, Taunton, for Carnations.

To Messrs. Prins, Wisbech, for Daffodils, Tulips, Hyacinths.

Selected for trial at Wisley.

Primula malacoides 'Mauve Queen,' from Messrs. Sutton, Reading.

Primula malacoides 'Queen of Whites,' from Messrs. Sutton, Reading.

Primula malacoides 'Rosella,' from Messrs. Watkins & Simpson, London.

Primula sinensis 'Double Queen of Pinks,' from Messrs. Sutton, Reading.

The following awards were recommended after trial at Wisley:

Award of Merit.

To *Primula malacoides* 'Duchess of Kent,' from Messrs. Carters Tested Seeds, Raynes Park. See p. 189.

To *Primula malacoides* 'Melody,' from Messrs. Watkins & Simpson, London. See p. 189.

Other Exhibits.

Misses Allen-Brown, Henfield: Violets and Carnations.

Messrs. Brooks, Worthing: *Primula stellata* 'Vivid.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Cheal, Crawley, for flowering trees and shrubs.

Silver Banksian Medal.

To Messrs. Hollamby, Groombridge, for flowering shrubs.

To the Knap Hill Nursery, Woking, for flowering shrubs.

To Messrs. Stuart Low, Enfield, for Camellias and other shrubs.

To Messrs. Russell, Windlesham, for flowering shrubs.

Flora Medal.

To Messrs. Barr, Taplow, for Narcissi and other bulbous plants.

To Brookside Nurseries, Oxford, for Saxifrages in pans.

To Messrs. Gill, Penryn, for Rhododendrons and Anemones.

To Messrs. Hillier, Winchester, for flowering shrubs.

To Hocker Edge Gardens, Cranbrook, for rock garden plants.

To Mr. E. Ladhams, Elstead, for rock garden plants.

To Messrs. Prichard, Christchurch, for rock garden plants.

Banksian Medal.

To Alpine Nurseries, West Moors, for rock garden plants.

To Messrs. Bedford & Page, Cambridge, for rock garden plants.

To Messrs. Cheal, Crawley, for rock garden plants.

To Mr. J. Klinkert, Richmond, for clipped trees.

To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.

To Messrs. Neale, Worthing, for succulents.

To Messrs. Southgate, New Malden, for succulents.

To Messrs. Stewart, Ferndown, for rock garden plants and shrubs.

To Messrs. Waterer, Twyford, for rock garden plants.

To Mr. G. Welch, Cambridge, for rock garden plants.

To Messrs. Wood, Taplow, for rock garden plants.

Other Exhibits.

Mrs. G. Blathwayt, Minehead: *Streptocarpus caulescens*.

Messrs. Burkwood & Skipwith, Kingston: flowering shrubs.

Messrs. Clark, Dover: shrubs.

E. D. Doncaster, Esq., Burley : varieties of *Rhododendron moupinense.*
Miss Hopkins, Coulsdon : rock garden plants.
Miss Hutley, Maldon : varieties of *Iris reticulata.*
Lady Lawrence, Dorking : *Cyclamen persicum.*
Rev. Canon Rollo Meyer, Little Gaddesden : Irises and Crocuses.
Mrs. Maurice Pope, Chippenham : *Echeveria retusa.*
Messrs. Redgrove & Patrick, Sevenoaks : rock garden plants.
Messrs. Reuthe, Keston : flowering shrubs.
L. de Rothschild, Esq., Exbury : *Rhododendron* × ' Bric-a-brac.'
Messrs. Russell, Windlesham : *Gelsemium sempervirens.*
The Director, R.H.S. Gardens, Wisley : *Forsythia Giraldiana.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :—

First-class Certificate.

To *Cymbidium* × ' Jeanette ' var. ' Jeanine ' (*Alexanderi* × ' Joy Sander ') (votes 10 for, 2 against), from the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey. See p. 188.

Award of Merit.

To *Cypripedium* × ' Medway ' (' Chardmoore ' × ' Windrush ') (votes 9 for, 3 against), from Messrs. Armstrong & Brown, Tunbridge Wells. See p. 188.

To *Cymbidium* × ' Madonna,' Castle Hill var. (*Alexanderi* × ' Memoria P. W. Janssen ') (votes 11 for, 5 against), from the Hon. H. S. Tufton. See p. 188.

To *Odontioda* × ' Beatrix ' var. ' Jewel ' (*Odontioda* × ' Gwendoline ' × *Odontioda* × ' Melina ') (votes 13 for), from Messrs. Charlesworth, Haywards Heath. See p. 189.

Cultural Commendation.

To Mr. B. F. Perfect, Orchid grower to Sir Jeremiah Colman, Bart., Gatton Park, Surrey, for *Bulbophyllum comosum,* with 21 flower-spikes.

To Mr. F. Streeter, gardener to the Lady Leconfield, Petworth Park, Sussex, for well-cultivated examples of *Calanthe* × ' Baron Schröder.'

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group of Orchids.
Messrs. Sanders, St. Albans : a group of Orchids.
Messrs. Stuart Low, Jarvis Brook : a group of Orchids.
Messrs. H. G. Alexander, Tetbury : a group of Orchids.
Messrs. Armstrong & Brown, Tunbridge Wells : a group of Orchids.
Messrs. McBean, Cooksbridge : a group of Orchids.
The Hon. Mrs. E. F. Lawson, Hall Barn, Beaconsfield, Bucks : *Cymbidium* hybrids.
W. F. Higgins, Esq., Croydon : *Saccolabium calceolare.*

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Award Recommended :—

Banksian Medal.

To Messrs. Wakeley, 74 Bankside, London, S.E. 1, for an exhibit of Daffodils and Tulips.

Other Exhibit.

Messrs. H. Prins, Wisbech : *Narcissus* ' Feu de Joie.'

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and eight other members present.

Award Recommended :—

Preliminary Commendation.

To *Sternbergia Fischeriana* as a flowering plant for the rock garden (votes unanimous), from Lieut.-Colonel C. H. Grey, Hocker Edge Gardens, Cranbrook, and Messrs. M. Prichard, Riverslea Nurseries, Christchurch.

Other Exhibits.

G. P. Baker, Esq., Sevenoaks : *Romulea nivalis, Colchicum libanoticum* (**A.M.** 1924).

JOINT IRIS COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and eleven other members present.

Award Recommended :—

Preliminary Commendation.

To *Iris (reticulata)* ' Aurora,' for general garden use (votes unanimous), from Miss A. L. Hutley, Wentworth House, Maldon, Essex.

Selected for trial at Wisley.

Iris (reticulata) ' Aurora ' and *Iris (reticulata)* ' Wentworth,' both from Miss A. L. Hutley, Maldon, Essex.

Other Exhibit.

Mr. C. A. Jardine, Feltham, Middx.: *Iris unguicularis*, a form near *I. unguicularis speciosa.*

ANNUAL GENERAL MEETING.

FEBRUARY 22, 1938.

REPORT of PROCEEDINGS at the ONE HUNDRED AND THIRTY-FOURTH ANNUAL GENERAL MEETING, held on Tuesday, February 22, 1938, in the New Hall, Greycoat Street, Westminster, London, S.W. 1.

The Lord ABERCONWAY, C.B.E., V.M.H., President, in the chair, with Members of Council and about two hundred Fellows.

The SECRETARY read the notice convening the Meeting.

The SECRETARY announced that the Minutes of the last Meeting, held on February 23, 1937, had been circulated in the JOURNAL, Vol. **62**, Part 4, 1937.

The PRESIDENT: The Minutes of the last Meeting have been circulated. Is it your pleasure that I sign them as being correctly recorded ?

The motion was agreed and the Minutes were signed by the Chairman.

The CHAIRMAN : Ladies and Gentlemen, I rise to move that the Report of the Council and the Accounts of the Society be and are hereby approved and adopted. That Report records the many activities of the Society and it is of course a formal one. Therefore, I presume that as it has been circulated, you will take it as read.

Again, we had the great gratification at the Chelsea Show last year to receive a visit from Their Majesties, and that in spite of the many engagements inseparable from a Coronation Year. The interest and knowledge that they displayed during that visit was a proof that it was not a mere duty visit, but one of pleasure. I very much hope that the tradition which has been unbroken for a very great many years past, namely, that Their Reigning Majesties shall visit the Chelsea Show, will not be broken this coming year, but that we shall have the gratification of seeing them again. We were also

greatly honoured by a visit from Queen MARY and other members of the Royal Family.

We have again to congratulate ourselves on the numbers included on our Roll of Fellows. The net increase for the year just passed is no fewer than 1,880 Fellows, and the total now stands at 35,772, a figure that would have been quite undreamt of only a few years since. Those figures prove, not only that the art and practice of gardening is making great strides in this country, but also that the horticultural feast—if I may so express it—that we spread before our Fellows is both acceptable and attractive. It is incontestable that our Shows do whet the appetite for more gardening and do not cloy it.

The increase in Fellowship of course has one disadvantage: it makes our Chelsea Show very crowded, and when one in vain tries to read the label on some coveted plant over the shoulders of a great crowd, or is swept along past the stand one wants to see, one rather feels that one would like to be the only visitor to Chelsea. But I would remind you that, although there is a proverb "The fewer the better fare," there is also a proverb "The more the merrier," and I am sure that any lady in this gathering would agree with me that no London party is a real success unless the rooms are crowded to suffocation and unless it takes ten minutes to walk up the front staircase. That does not always apply to a Flower Show, which can be too crowded, but the Council, with the help of Mr. DURHAM and Mr. SIMMONDS, is doing what it can to relieve the crowding. In the first place, we will continue the practice we adopted last year for the first time of having two large marquees instead of one marquee and a number of small tents; and in the second place, we will provide broader gangways in these tents. We are used, of course, in London nowadays to one-way traffic, and we have been considering whether it would help matters if we had one-way traffic at the Chelsea Show. But that in fact has been tried at other Shows and has not proved a success; therefore, we do not at present propose to adopt that method. If you are an experienced Show-goer and if you go a little early or a little late, you will find that you will see the Show in comparative comfort.

On the other hand, it must be remembered that although each additional Fellow naturally costs the Society more, yet there is a substantial margin, and as the Fellowship increases, so a bigger margin becomes available which can be spent on objects for the common benefit of all the Fellows.

We must also remember that after all the whole object of our Society is to encourage gardening in this country, and we think there is no better way of encouraging people to be good gardeners than by enlisting them as Fellows of this Society. For those reasons our Council welcomes the increase in the Fellowship, and, in order to do nothing to check it, has decided again this year that the Entrance Fee shall not be re-imposed.

As regards our Shows, thanks to our friends and allies, the members of the nursery trade, thanks also to certain amateurs, they have lacked

neither beauty nor interest. I personally very much regret, and very many Fellows will join with me in this, that it has not been possible in this year 1938 to arrange a great Autumn Show, but we found again that no hall which was suitable in the eyes of the exhibitors—really theirs must be the criterion—was available. We hope, however, in 1939 to have again the Autumn Show at Olympia.

After the last Annual Meeting I was able to visit the United States, one of my purposes being to see the three great Spring Shows that take place there. The Shows are held in the spring at Boston, Philadelphia and New York, and representing as I did the Royal Horticultural Society, I was most cordially and hospitably received. One thing that struck me very much in these shows was the beauty of the arrangement of each individual stand and the way in which many individual stands were often so grouped together as to produce what may be called a scenic effect. As the result of this the shows made a very wide appeal to the non-gardening public. Many fewer people of course are interested in gardening in the United States proportionately to those in this country, but the shows were crowded with people who just came from the town, most of whom, so I was informed, had no gardens at all.

I was very specially struck by the beauty of individual flower arrangements, sometimes done by one person, sometimes done by a garden club. They had most beautiful bouquets and flowers in vases each in a little compartment with top lighting, and these were a great centre of interest. The Council was good enough to accept my suggestion that we should have a similar competition for vases of flowers at one of our fortnightly Shows in Autumn in London, and I am glad to say that the competition was a great success. There were no fewer than forty-three exhibits, and we had some most beautiful arrangements among them.

I came, however, to the conclusion that the method of arrangement and the scenic effects that obtain in the United States Shows were not conducive to showing such a large variety of plants as we do. There is no doubt that our Shows are pre-eminent over any Shows in the whole world for the variety of plants and the number of new and rare plants that are shown. Of course, that is partly owing to the fact that in our climate we can grow a very large range of plants, and also to the fact that we have many skilled hybridizers and selectors of plants who are always improving the breed or the strain.

It is also, however, partly due to the fact that for some two hundred years we in this country have been very active in sending out collectors to all parts of the world to collect for us new and rare plants. In the last century the rage was all for greenhouse plants, orchids and stove plants, and plants that were not hardy, although a certain number of hardy conifers was collected. But in the last thirty-eight years there has been very great activity in the direction of sending out collectors to collect hardy plants, and that has had a wonderful effect on the gardens of this country. I remember visiting recently a garden that

some thirty years ago was owned by a very noted plantsman and collector, who grew in that garden practically every plant that could be grown outdoors in England at that time. He died in 1906 and since that time no new plants were added to the collection. That garden, to one who is used to modern gardens, was extraordinarily uninteresting. One felt that such a lot of very beautiful plants were not there simply because they had not been introduced before 1906.

The Royal Horticultural Society has always supported collecting expeditions; at one time it sponsored them entirely. This year we have supported an interesting collecting expedition that is taking place in China. The authorities at the Edinburgh Botanic Gardens got in touch with a Chinese botanist of great repute, Dr. HU, and he started a band of collectors collecting as far as possible in parts of China which had not been botanically explored before. We do not yet know how far he has been successful in sending his collectors to hitherto unexplored districts, because many of those districts are much disturbed, but he is doing his best. A large consignment of seeds is on the way, a portion of which will come into the possession of our Society, and we have decided to subscribe again to the continuance of this collecting expedition in the current year. We hope we may have some very interesting results from it, and those results will be available in our Wisley distribution of plants in a year or two.

There has also been an increasing number of new plants coming before the various Committees, and not only before the Committees of the Society, but before the Joint Committees, Committees manned partly by representatives of the Royal Horticultural Society and partly by representatives of kindred societies who specialize in various plants. For instance, among others we have Joint Committees of the Royal Horticultural Society and the Alpine Garden Society, the Royal Horticultural Society and the Rhododendron Association, and Colonel DURHAM has just been able to arrange another Joint Committee which will act this year in co-operation with the National Chrysanthemum Society for the judging of early-flowering Chrysanthemums. These Joint Committees prevent the duplication of awards, and members of the two Societies concerned see that awards are not given to plants that are not really worthy of them.

I turn to Wisley. The Wisley Gardens, like all well-regulated gardens, are growing both in interest and in beauty. We are having more visitors every year. To those of you who have not yet been to Wisley—there can be but few among you who have not—I would say that it is only an hour from London by car and half the way is through some of the most beautiful scenery that can be found near London. I understand that the Government or the County Council are building two fly-over crossings on the Kingston By-pass—I assume entirely in order to enable Fellows of the Society to make the journey from London to Wisley more swiftly.

We have already planted with ornamental flowering Cherries part of the new ground that we have acquired at Wisley that is called

Battleston Field, and we hope that eventually "Cherry time at Wisley" may rank in popular esteem with "Cherry time in Japan." Battleston Hill itself, which is well wooded, we are planting with Rhododendrons and Azaleas; that work is now almost complete under Mr. HARROW'S skilful superintendence. On another portion of the new ground we are going to have Rhododendron Trials. At present we have the trials through the courtesy and help of Mr. LIONEL DE ROTHSCHILD at Exbury. Mr. LIONEL DE ROTHSCHILD suggested that, while he is quite willing to continue the trials at Exbury if we so wish, they might be more accessible to our Fellows and members of the Committee, and to those interested in Rhododendrons, if they were held at Wisley. So this autumn the Rhododendrons are being moved over to Wisley, and we shall hold the trials there.

Then I usually say a few words about our publications. The Lily and Daffodil Year Books have appeared as usual. They are full of interest to specialists in those plants and they are not uninteresting even to those who are laymen in that branch of horticulture. But the big work that we have published this year is the Index to our JOURNAL, a volume due to the scholarly and methodical industry of Mr. CHITTENDEN. That Index is designed for two uses: a specialist use in that it will give all the awards that have been made to plants since the inception of the Society, which will make it very useful for those who are exhibiting plants before the various Committees. Its general use will be to make available the buried treasures of the Society's JOURNAL for a hundred years. Just consider the amount of writing in that JOURNAL; I have the numbers going back fifty years, and it takes a bookshelf eight feet long—I measured it the other day. The number of interesting articles in that JOURNAL is almost without compare, and if you look up practically any plant in that Index, you will find reference after reference to pages in the JOURNAL where something is written about it.

Of course all of us do not have the JOURNAL from the beginning, but it is always available in the Lindley Library, and if you are interested in any particular plant, I can recommend you to look it up in the Index and read the articles upon it in one or another volume of our JOURNAL.

Then we have published a book called "Some Good Garden Plants." The Editor of that is also Mr. CHITTENDEN, indeed he has written it himself. That book describes most of the plants—all but thirty or forty—which have received the Award of Garden Merit. As you know, that Award is given at Wisley by a Committee of experts; and it is given only to plants which are easily grown and readily obtainable in the trade, and it is given only to plants of great distinction. I would advise those Fellows of the Society who have not got that book to get it and study it, and to grow all the plants in it. Practically all the plants can be grown in every garden, the only exception being a few Rhododendrons, which of course cannot be grown in lime.

In May the Horticultural Colour Chart will be published by the

British Colour Council in co-operation with our Society. In this some noteworthy botanists have assisted, because every colour is compared with a certain flower. It will be cheap, only 10s., and it will have four hundred different shades of colours in it. If, as I hope will be the case, it gets into the hands of nurserymen and is utilized as a basis for colour descriptions in catalogues, we shall have no more of those disappointments that we sometimes have when we get a flower from a catalogue described as " red " and find there is a considerable amount of blue in it, and get a " blue " flower and find it is tinged with a certain amount of red. This will be a great work, and I recommend it to your support.

At this meeting we always have to lament some losses in the ranks of the Council. We shall miss very greatly the late Mr. BRIDGEFORD, who was removed from us by death ; he was a help in very many branches of our activities. We shall also miss Mr. BOWES-LYON, the youngest but by no means the least useful member of our Council ; he retires at the expiration of his term of office, but we hope that he may return to us after his statutory year in the wilderness. Mr. TROTTER, our Treasurer, we cannot allow to pass from us. Fortunately, one of the bye-laws in our Charter enables the Council to nominate for immediate re-election one of the three retiring members if it feels disposed to do so, and we feel that that power should be exercised in the case of Mr. TROTTER, and it has accordingly been so exercised. He is up for re-election to the Council, and as there is no alternative nomination, he will be returned again. His words of financial caution show the Council that there are two sides to every new project, and he often reminds us that if you eat your cake you will have to pay for it afterwards.

In place of Mr. BRIDGEFORD and Mr. BOWES-LYON we have to welcome Mr. OLDHAM, a tried friend who returns to us. He has more leisure now on his retirement from business, and what the business world has lost we of the Council shall gain. The second member is Mr. LEWIS PALMER, a very keen gardener who has not hitherto been on the Council, who we hope will carry on the very splendid traditions of his father-in-law, the late Lord WAKEHURST, who did so much for gardening and for the Society.

Our Staff is practically unchanged ; that is what we want, because we think that if we changed it we should not change it for the better. I think that all the Fellows owe them appreciation and gratitude for the work they have done for us.

Our thanks are also due to our trade friends who have made our Shows a success, and who at every meeting exhibit fresh floral triumphs. We owe our thanks to the Press, which is very kind to us and gives us publicity of the right kind. We owe also a great deal of gratitude to a host of voluntary workers : there are the members of the Council, of our various Committees, our Judges and those who write for our various publications. We draw on their help very heavily indeed, and that help is as inexhaustible as the contents of the traditional

widow's cruse. Last, but not least, the Council and I are very grateful to the Fellows who are kind enough to overlook all our shortcomings and who continue to repose their confidence in us.

I will now ask Mr. TROTTER to make his statement and second the adoption of the Report.

Mr. R. D. TROTTER: Most of the items of expenditure in the Vincent Square Accounts are quite normal, and I am only going to refer to a few which differ substantially from last year's figures.

Salaries and Wages show a small increase caused by additions to the Staff, plus the usual annual increments, and are balanced by the larger allocations we have had to make towards Chelsea and the Autumn Show. You will see the figure in the Accounts appears to be approximately the same as last year.

The JOURNAL and Publications show a net increase of £201, which is mainly due to the increased cost of printing and an increase of 1,500 in the circulation of the JOURNAL.

The total cost of meetings has increased by £2,790 and that is accounted for by the increase in the Chelsea Show Account of £2,247, and the cost of the Autumn Show £1,066, from which we can deduct the amount of £523, the decrease in the cost of meetings in the Society's halls. The reason for the increase in the expenses at Chelsea, as the President has already told you, was the improvement in the tentage, as it will be remembered that a second large marquee was erected to replace the small ones which in previous years had accommodated the roses, orchids and scientific exhibits. This necessitated spending considerable sums on drainage and the initial costs of the marquee itself. Other items of expenditure at Chelsea were of a special nature, namely, the cost of the Empire Exhibit, over £900, and the Accession Cups, over £400, which are shown separately in the Balance Sheet.

The usual donations have been made to the Horticultural charities and scientific institutions, and we have taken shares in plant-hunting expeditions. The total is less this year by £230, due to the fact that last year we subscribed £105 to the National Memorial to King George V and spent £101 on the Alpine Conference.

Then we come to the Receipts. Subscriptions show an increase of £2,290, the net increase in Fellowships being 1,880, and the Hall Lettings show a better return.

The result of the Revenue and Expenditure Account after charging the net expenditure at Wisley, which I will refer to later, discloses a surplus of £6,752, as compared with £5,194 in 1936, but this can be deemed fairly satisfactory when it is realized that the special expenditure at Wisley, amounting to £4,547, has been written off to Revenue.

In the Vincent Square Balance Sheet no material change has been made this year. On the liabilities side the Accumulated Funds Account remains at £250,000. I will not give you all the items, but "Sundry Creditors" includes such items as: ground rent, fuel, gas, electric light, JOURNAL, income tax, etc.

Bank Overdraft appears in the Accounts, and is due to investing anticipated surplus on the year; it has since been liquidated by new subscriptions coming in.

Then there is a new item in our accounts entitled "The Dame Julia M. Tilden Legacy Suspense Account." This legacy has been received during the year and is held in suspense until such time as the Council decides to what purpose it shall be placed. It would be very nice if other people would copy Dame Tilden's example.

The General Reserve Fund now stands at £28,324 5*s.* 8*d.*, the additions during the year being the surplus Revenue and two items of profits on sale of investments.

On the Assets side, the Sinking Fund has been increased by £3,961. This is made up of the annual appropriation which we take at £3,366, plus the interest and profit on sale of investments.

The freehold property at Wisley has been increased by the purchase of land adjoining Battleston Hill, which cost £2,500, but in accordance with the Council's usual policy the cost has been written down to £1. There are several restrictions on the use of that land, and the Council decided it was best to treat it as usual and write it down to this amount.

General Investments have increased by £16,822 10*s.*

Sundry Debtors include stock of cups, hall lettings, income tax recoverable, dividends accrued, colour chart, etc.

Revenue and Expenditure Accounts—Wisley. The Establishment expenses have increased by £63, of which rates and taxes account for £22 and miscellaneous items for £49.

"Laboratory and School of Horticulture" increased by £128, mainly due to wages.

"Gardens" increased by £766. In the autumn of 1936 a new scale of wages was adopted for the gardens at Wisley, and as a result the wages account has increased by £477. The plant distribution cost a further £44 and miscellaneous items a further £252, which includes spraying materials £79, implements and repairs £100, Bothy supplies £32.

Dividends show an increase of £22; Garden Sales £317, mainly due to good prices for the fruit crop, and plant distribution receipts £42.

The result of the Wisley normal expenditure is £12,867, as against £12,270 in 1936.

Special expenditure at Wisley totalled £4,547 as you will see in the Balance Sheet, and a list of the items will be noticed at the foot of the Revenue and Expenditure Account, the chief items being £2,499 for purchase of land adjoining Battleston Hill, already referred to, and £732 for water supply.

There is very little change either in the Wisley Balance Sheet or in the Trust Accounts. Details of all the Trusts appear at the end of the Accounts. This year we have not given you the full holdings of stocks.

I have very much pleasure in seconding the adoption of the Report. May I take this opportunity of thanking you, Mr. President, for the very kind words you said about myself in your opening speech.

After inviting questions and answering two put by Mr. ELLIS, the President put the motion for the adoption of the Report and it was carried unanimously.

Mr. E. A. BOWLES: It is the custom of the Society that the Vice-Chairman of the Council should finish, as his last duty of his closing year of office, by making a declaration to you concerning the Presidency of the Council. I am delighted that it is my privilege and pleasure to be able to announce to you that, in consideration of the unanimous request of the Council, Lord Aberconway has very kindly consented to accept the Presidency for this coming year.

The PRESIDENT: I think it is a very great honour to have been re-elected as your President for the coming year. There is no form of work that I enjoy more than the work that I do in conjunction with my friends the members of the Council of the Royal Horticultural Society, and I thank you all from the bottom of my heart.

I now declare the election of the following other officers of the Society. First, the following list of Vice-Presidents:

The Duke of Bedford.
The Duke of Portland.
The Viscount Ullswater.
Sir Daniel Hall.
Lieut.-Colonel Sir David Prain.
Mr. E. A. Bowles.
Mr. C. T. Musgrave.
Mr. C. G. A. Nix.
Mr. J. C. Williams.

These names have all been circulated to the Fellows. As there are no alternative nominations, I declare them duly elected. We are most fortunate in having so distinguished a list of Vice-Presidents, distinguished from the horticultural as well as from other points of view.

I also, under the same circumstances, declare duly elected as members of the Council:

Mr. W. R. Oldham.
The Hon. Lewis Palmer.
Mr. R. D. Trotter.

As Treasurer, Mr. R. D. Trotter; as Auditor, Mr. J. S. Feather of Messrs. Harper, Feather & Paterson.

The President then made the following presentations:

PRESENTATIONS.

Victoria Medals of Honour.—To British Horticulturists resident in the United Kingdom and deserving special honour at the hands of the Society.

The SECRETARY: Mr. MARK FENWICK.

The PRESIDENT: Mr. MARK FENWICK you all know as the creator of a most beautiful garden in which he grows many rare and difficult plants. He has also, as you well know who attend these Shows, made something of a corner in the Sewell Medal by winning it with unvarying regularity.

The SECRETARY: Mr. W. R. OLDHAM.

The PRESIDENT: Mr. OLDHAM is a grower of trees and shrubs on a truly colossal scale, and very few gardens are not richer for shrubs that have been grown in his great nurseries. I congratulate you, Mr. OLDHAM, on all the work you have done.

The SECRETARY: Mr. F. C. PUDDLE.

The PRESIDENT: It gives me great pleasure to present this medal to Mr. PUDDLE, not merely because he is a friend of mine, a very close friend of many years standing, but because he is a man who lives for gardening; his skill, acquired by a lifetime of hard work in gardens and real scientific knowledge, is concentrated on the cultivation and improvement of the hybridization of plants, and no one can say more for a gardener than that.

The SECRETARY: Dr. FRED STOKER.

The PRESIDENT: Dr. STOKER has a mind which has been trained in one of the most exacting of schools, the school of medicine, and he has brought all that trained mind to the study and cultivation of plants. I think we may recognize that he is as outstanding in his hobby as he was in his professional work.

The SECRETARY: Dr. H. V. TAYLOR.

The PRESIDENT: Dr. TAYLOR, as you know, has the power of the Government behind him, and it is his task to direct—and he does it most successfully—the assistance the Government can give into those channels where it will be most productive of improvement in research and cultivation.

The Associateships of Honour were then conferred upon the following:

Mr. JOSH BRACE, foreman at Messrs. Rivers' Nurseries.

Mr. D. CAMPBELL, Superintendent of Regent's Park.

Mr. C. H. MIDDLETON, Horticultural Instructor to the Surrey County Council.

Mr. F. J. ROSE, Head Gardener at Townhill Park, Southampton.

The Lawrence Medal.—To Mr. ROBERT BOLTON, for his exhibit of British Ferns staged on August 17, 1937.

The Holford Medal.—To Lord RENDLESHAM, for his exhibit of Daffodils staged on April 6, 1937.

The Veitch Memorial Medal in Gold.—To Mr. C. H. CURTIS, F.L.S., V.M.H., for his services to Horticultural journalism over forty years.

The Veitch Memorial Medal in Silver and £25.—To Mr. DAVID WILKIE, for his book on Gentians.

The Veitch Memorial Medal in Silver.—To Mr. G. RUSSELL, for his work in selecting the " Russell " strain of Lupins.

The Sander Medal.—To Messrs. BLACKMORE & LANGDON, for Begonia ' Scarlet Glow ' shown on June 8, 1937.

The George Moore Medal.—To Captain The Hon. H. R. BROUGHTON, for *Cypripedium* ' Diana Broughton ' var. ' Alcestis ' shown on December 14, 1937.

The Williams Memorial Medals.—To Messrs. ARMSTRONG & BROWN, for their exhibit of Cypripediums staged on January 12, 1937.

To Messrs. BAKERS, for their exhibit of Lupins staged on June 8, 1937.

The Reginald Cory Memorial Cup.—To Mr. C. R. SCRASE-DICKINS, M.A., D.L., V.M.H., for his Rhododendron ' Little Ben ' (*R. repens* × *R. neriiflorum*) shown on March 23, 1937.

The Loder Rhododendron Cup.—To Mr. J. F. ROCK, of the Department of Agriculture, Washington, D.C., U.S.A., for the introduction of many species of Rhododendrons as the result of his intrepid exploration of the Mountains of Western China.

That, Ladies and Gentlemen, concludes our presentations.

Captain HAWKER : I have the most pleasant task of proposing that the thanks of this meeting go to the President for taking the Chair on this occasion. Those of you who have been here before will agree that we hardly know which to admire the more in our President, his great knowledge of horticultural matters, or the very businesslike way in which he conducts our meetings. We all recognize how fortunate we are in having a President like Lord ABERCONWAY, who combines great knowledge of horticulture with business ability. I have the greatest pleasure in proposing a Vote of Thanks to the President for his conduct in the Chair.

Mr. MACDONALD: It is a very great privilege to second the Vote of Thanks so ably proposed by Captain HAWKER. We all feel that the great services our Chairman has rendered to the R.H.S. and to Horticulture in general are worthy of our most sincere thanks. We listen with the greatest respect to the speeches that he always makes at the Annual Meetings. With these few remarks I have much pleasure in seconding the Vote of Thanks.

Captain HAWKER: It is hardly necessary for me to put it to the meeting, but I am sure you will approve with acclamation.

(*Motion put and carried with acclamation.*)

The PRESIDENT: I will not inflict another speech upon you. I will only say to the Mover and Seconder and to you all here assembled "Thank you very much."

That concludes our business.

(*The proceedings then terminated.*)

GENERAL MEETINGS.

FEBRUARY 22, 1938.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Strawberry Weevil from Falklands.—Mr. G. Fox Wilson showed a weevil, a species of Listroderes not so far identified, which was found attacking Strawberries in the Falkland Islands.

Nut for Identification.—Dr. Tincker reported that the nut shown at a previous meeting has proved to be *Persea gratissima*.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twenty-one other members present.

Award Recommended:—

Silver-gilt Hogg Medal.

To Messrs. Allgrove, Middle Green, Langley, Slough, for a collection of Apples.

Other Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Apple 'Belle de Boskoop.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Fortosh' and 'Rosemary Russet.'

Messrs. Rivers, Sawbridgeworth, Herts: Citrus fruit trees in pots, and a collection of Apples.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and twelve other members present.

Awards Recommended:—

Silver-gilt Flora Medal.

To Messrs. Sutton, Reading, for Primulas.

Silver Flora Medal.

To Messrs. Bath, Wisbech, for Daffodils, Tulips, Hyacinths, etc.

To Messrs. Carters Tested Seeds, Raynes Park, for *Primula malacoides*.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Barr, London, for Daffodils, Crocuses, and other bulbous plants.

To Messrs. Blackmore & Langdon, Bath, for Cyclamen.

To Mr. G. H. Dalrymple, Bartley, for Freesias.

To Messrs. Dobbie, Edinburgh, for Daffodils and Hyacinths.

To Messrs. Pearson, Lowdham, for Daffodils, Hyacinths, Crocuses, etc.

To Messrs. Prins, Wisbech, for Daffodils, Tulips, Hyacinths.

To Messrs. Wakeley, London, for Crocuses.

Flora Medal.
To Messrs. Dobbie, Edinburgh, for Primulas.
To Messrs. Engelmann, Saffron Walden, for Carnations and *Euphorbia fulgens*.
To Messrs. Napier, Taunton, for Carnations.
To Messrs. Toogood, Southampton, for *Primula obconica*.

Banksian Medal.
To Ashington Nurseries, Ashington, for Carnations.
To Mr. F. Everitt, Enfield Lock, for Clivias, Primulas, Cyclamens, etc.
To Messrs. S. Low, Enfield, for Carnations.

Award of Merit.
To Hippeastrum 'Edward Cartwright' as a greenhouse plant (votes unanimous), from R. F. W. Cartwright, Esq. (gr. Mr. F. Humphris), Banbury. See p. 188.

Selected for trial at Wisley.
Primula malacoides 'Freedom,' from Messrs. Sutton, Reading.
Primula malacoides 'Peter Pan,' from Messrs. Carters Tested Seeds, Raynes Park.
Primula malacoides 'Pink Sensation,' from Messrs. Sutton, Reading.

Other Exhibits.
R. F. W. Cartwright, Esq., Banbury: Hippeastrums 'Aynho Park' and 'Zarita.'
C. F. Lumb, Esq., Kingston Hill: *Primula malacoides* 'Double Pink.'
Mr. Roper, Chard: Lachenalia.
Messrs. Sutton, Reading: *Primula sinensis* 'Scarlet King' (to be seen again).

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-three others members present.

Awards Recommended:—

Silver-gilt Flora Medal.
To Messrs. C. Elliott, Stevenage, for Saxifrages and other rock garden plants.

Silver-gilt Banksian Medal.
To Brookside Nurseries, Oxford, for Saxifrages.

Silver Flora Medal.
To Messrs. Cheal, Crawley, for flowering trees and shrubs.
To Knap Hill Nursery Co., Woking, for flowering trees and shrubs.
To Messrs. Waterer, Bagshot, for flowering trees and shrubs.

Silver Banksian Medal.
To Hocker Edge Gardens, Cranbrook, for rock garden plants.
To Messrs. Hollamby, Groombridge, for flowering trees and shrubs.
To Messrs. Russell, Windlesham, for flowering trees and shrubs.
To Messrs. Wood, Taplow, for flowering trees and shrubs.

Flora Medal.
To Messrs. Hillier, Winchester, for flowering trees and shrubs.
To Messrs. Stuart Low, Enfield, for Camellias and other flowering shrubs.
To Messrs. Prichard, Christchurch, for rock garden plants.
To Mr. G. Welch, Cambridge, for rock garden plants.

Banksian Medal.
To Alpine Nurseries, West Moors, for rock garden plants.
To Messrs. Bedford & Page, Trumpington, for rock garden plants.
To Messrs. Cheal, Crawley, for rock garden plants.
To Dartington Hall, Ltd., Totnes, for rock garden plants.
To Messrs. Ingwersen, East Grinstead, for rock garden plants.
To Mr. R. Kaye, Silverdale, for rock garden plants.
To Mr. E. Ladhams, Elstead, for rock garden plants.
To Mr. L. Lawrence, Taplow, for succulents.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. Neale, Worthing, for succulents.
To Messrs. Redgrove & Patrick, Sevenoaks, for rock garden plants.
To Messrs. Reuthe, Keston, for flowering shrubs.
To Messrs. Stewart, Ferndown, for rock garden plants and shrubs.
To the Swanley Horticultural College, Kent, for Begonias.
To Messrs. Waterer, Twyford, for rock garden plants.
To Mr. G. G. Whitelegg, Chislehurst, for rock garden plants.
To Messrs. Wood, Taplow, for rock garden plants.

Award of Merit.

To *Billbergia nutans* as a flowering plant for the cold house (votes 14 for), from Mrs. S. H. Whitbread, Biggleswade. See p. 188.

To *Homeria elegans* as a flowering plant for the cold house (votes 14 for), from T. T. Barnard, Esq., Wareham. See p. 188.

Preliminary Commendation.

To *Rhododendron Beanianum* as a hardy flowering shrub (votes unanimous), from Lord Aberconway, Bodnant.

To *Rhododendron* 'Elisabeth' (*R. repens* × *R. Griersonianum*) (votes unanimous), from Lord Aberconway, Bodnant.

Other Exhibits.

T. T. Barnard, Esq., Wareham: *Protea sp.*
Messrs. Burkwood & Skipwith, Kingston: flowering shrubs.
Chez Nous Nurseries, Newick: rock garden plants.
Mr. A. Corderoy, Eltham: rock garden plants.
Messrs. Fielden & Crouch, Wrotham: rock garden plants.
Mrs. F. Hiley, Paignton: rock garden plants.
Messrs. Hollamby, Groombridge: *Cupressus obtusa nana gracilis.*
Miss Hopkins, Coulsdon: rock garden plants.
Mr. J. Klinkert, Richmond: clipped trees.
Letchworth Plants, Ltd., Letchworth: rock garden plants.
Marsden Nurseries, Ashtead: rock garden plants.
Messrs. Oliver & Hunter, Moniave: *Erica carnea* 'Springwood Pink.'
Orchard Neville Nurseries, Glastonbury: rock garden plants.
Messrs. Rogers, Southampton: rock garden plants.
L. de Rothschild, Esq., Exbury: *Kennedya ovata trifoliata, Rhododendron* 'Sybil.'
Messrs. Russell, Windlesham: *Abutilon megapotamicum variegatum, Toxicophlaea spectabilis.*
Messrs. Southgate, New Malden: succulents.
Waterperry School of Horticulture, Oxford: rock garden plants.
White House Gardens, Abergavenny: rock garden plants.
Mr. R. Colpoys Wood, West Drayton: shrubs.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for a group.
To Messrs. H. G. Alexander, Tetbury, for a group.
To Messrs. Armstrong & Brown, Tunbridge Wells, for a group.
To Messrs. Black & Flory, Slough, for a group.
To Messrs. McBean, Cooksbridge, for a group.
To Messrs. Sanders, St. Albans, for a group.
To Messrs. Stuart Low, Jarvis Brook, for a group.

First-class Certificate.

To *Odontioda* × 'Minacis' (*Odontioda* × 'Acis' × *Odontioda* × 'Minos') (votes 9 for, 3 against), from H. S. Wharton, Esq., Templewood Avenue, Hampstead. See p. 189.

Award of Merit.

To *Odontoglossum* × 'Clonius' var. 'Colossus' ('Aquitania' × 'The Czar') (votes 12 for), from Messrs. Charlesworth, Haywards Heath. See p. 189.

To *Cymbidium* × 'Claudette' var. 'Juno' (*Coningsbyanum* × 'Miranda') (votes unanimous), from the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey. See p. 188.

To *Cymbidium* × 'Andromeda,' Harben's var. (*eburneo-Lowianum* × 'Flamingo') (votes 12 for, 2 against), from G. P. Harben, Esq., King's Somborne, Hants. See p. 188.

Cultural Commendation.

To Mr. A. Everest, Orchid grower to E. R. Ashton, Esq., Broadlands, Camden Park, Tunbridge Wells, for *Platyclinis glumacea*, with 100 flower-spikes.

Other Exhibits.

Messrs. Harry Dixon & Sons, Wandsworth: a group of Orchids.
Sir William Cooke, Bart., Hampstead Norris, Berks: Cymbidiums.
Lionel de Rothschild, Esq., Exbury: *Cymbidium* × 'Flamingo' var. 'Rex.'
Lord Aberconway, Tal-y-Cafn: *Cypripedium* × 'Snowsprite.'

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and eleven other members present.

Exhibit.

The only exhibit before the Committee was *Narcissus* 'Feu de Joie,' shown by Messrs. H. Prins, Duke Street, Wisbech.

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and fourteen other members present.

Exhibits.

Messrs. Ingwersen, Gravetye, E. Grinstead: *Primula Clarkei.*

Messrs. M. Prichard, Christchurch: *Colchicum luteum* (**A.M.** 1928), *Saxifraga* 'Mother Queen,' *Saxifraga* 'Buttercup.'

Mrs. H. P. Thompson, Weybridge: *Helleborus purpurascens.*

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. GEO. MONRO, C.B.E., V.M.H., in the Chair, and nine other members present.

Exhibits.

Messrs. Allwood Bros., Haywards Heath, Sussex: Carnations 'Pink Doris' (to be seen again) and 'Lady Hudson.'

Messrs. Napiers, Stepwater Nurseries, Taunton: Carnation 'Tauntonian' (to be seen again).

DONATIONS TO THE SOCIETY'S GARDENS AT WISLEY, 1937.

(*Continued from p.* xliv.)

HUMPHREYS, Dr. G. N., Southsea; collection of seeds from Mt. Everest expedition. HYDE, Miss M. H., High Green, Godalming; unknown plant. INGRAM, COLLINGWOOD, Benenden, Kent; seeds of *Erythrina indica*; plants of *Rhododendron sulfureum, Aristea caerulea*. INNSBRUCK BOTANIC GARDEN, Austria; seeds of *Helleborus lividus*. IZARD, J. P., Wembury, near Plymouth; seeds and cuttings of *Acacia mucronata*. JACKMAN, Messrs. G., Woking; plants of *Ceanothus* 'Gloire de Versailles,' *Spiraea hypericifolia*; collection of hybrid *Clematis*; stocks for Clematis and Pears. JARDINE, C A., Feltham, Middlesex; plants of *Iris unguicularis, Viola* 'Smoky Blue'; seeds of hybrid *Viola lutea* × *gracilis*. JEKYLL, F., Munstead House, Godalming; seeds of giant *Lobelia*. JENKIN, Dr. N., Hindhead; collection of plants for rock garden. JEWELL, Major M. F. S., Upton-on-Severn; plant of *Coptis quinquefolia*. JOHNSON, H. G. E., Throop, Bournemouth; plants of *Aubrietia* 'Coronation.' JOHNSON, Rev. W. R., St. Ervan, N. Cornwall; seeds of *Hesperantha* species. JOHNSTON, L., Mentone, France; collections of seeds. JONAS, A. C., Fordingbridge, Hants; seeds of *Paeonia lutea, Primula Poissonii, Phyllostachys aurea*. JOY, Mrs. D., Bentley, near Farnham, Surrey; plant of *Mimulus moschatus*. KERR, W. J., Shanghai; cuttings of contorted Willow. KEW ROYAL BOTANIC GARDENS; collection of shrub seeds; seeds of *Streptocarpus grandis*; seeds collected in Sikkim by B. J. Gould, Esq.; plants for the rock garden. KIEV BOTANIC GARDEN, U.S.S.R.; seeds of *Amygdalus, Cytisus* and *Verbascum*. KIRK, Lt.-Col. J. W., Gedling, Notts; plants of *Gazania*. LADHAMS, E., Elstead, Godalming; plants of *Campanula longestyla*. LANKESTER, C. H., Surbiton; seeds from Brazil and the Canary Islands; plant of *Aeonium* from Teneriffe. LAWRENCE, Lady, Dorking; fruits of *Maesa indica*; cuttings of *Olearia stellulata*. LAINSON, R. D., Piltdown, Sussex; seeds of Dahlias. LAXTON, Messrs., Bedford; trees of Plums 'Olympia' and 'Jubilee,' and Apple 'Pioneer.' LEMAN, H. M., Nottingham; seeds of Oak from Sherwood Forest. LENINGRAD ACADEMY OF SCIENCES, U.S.S.R.; collection of seeds. LESCHALLAS, Capt. H. P., Prestbury, Glos.; seeds of rock plants. LEWIS, Mrs., Chilworth, Guildford; collection of seeds from Western Australia. LEXINGTON BOTANIC GARDEN, Mass., U.S.A.; collection of seeds. LEYDEN BOTANIC GARDEN, Holland; collection of seeds. LINDSAY, Miss, Sutton Courtney, Berks; collections of seeds and plants from Persia. LINZ BOTANIC GARDEN, Austria; seeds of *Aquilegia* and *Lilium* species. LIVERTON, Miss M., Petersfield; seeds of 'Swan Plant' from Australia. LLEWELLIN, A. E., St. Lawrence, Isle of Wight; seeds from South Africa. LLOYD-JONES, B. G.; seeds of *Lilium Wallichianum* and *Luculia gratissima*. LOCK, Mrs.; plant of *Acanthosonchus cervicornis*. LOCKE-KING, Dame E., Weybridge; plants of *Brunfelsia, Camellia* and *Thalictrum*. LOFTHOUSE, T. A., Middlesbrough; seeds of *Meconopsis* and other plants. LONG, E., Bemerton, Salisbury; seeds of various Himalayan plants. LOW, Mrs. K. E., Rustington, Sussex; seeds and bulbs from Persia. LUND BOTANIC GARDEN, Sweden; collection of seeds. LYTTEL, Rev. Prof., Chilworth, Southampton; collection of seeds. MACAULAY, R. H., Kilmichael Glassary, Argyllshire; seeds of *Cyananthus, Gentiana, Incarvillea*; plants of *Cyananthus, Polygala, Rosa*. McDADE, C., Chattanooga, Tenn., U.S.A.; plant of *Hemerocallis* 'Dorothy McDade.' McDOUALL, K., Logan, Wigtownshire; cuttings of *Mesembryanthemums*. McLEAN, W. L. C., Hawkes Bay, N.Z.; seeds of *Clianthus puniceus roseus*. MAGOR, E. J. P., St. Tudy, Cornwall; seedlings of *Tripetaleia paniculata*. MARCHANT, W. J., Stapehill, near Wimborne; cuttings of various shrubs; seedlings of *Acer Hersii, Viburnum acerifolium*; seeds of *Berberis* species; plants of various shrubs, including quantity of *Rhododendron aperantum*. MARRIAGE, Mrs. G., Colorado Springs, U.S.A.; seeds of *Polemonium confertum*. MARTIN, Dr. A. HAYWARD, Cal., U.S.A.; seeds of *Ceanothus* and other native shrubs. MARTIN, Mrs., Sunningdale; plants of *Helianthus*, Heliotrope, *Prunus* and *Sambucus*. MARTINEAU, Lady, Wentworth, Virginia Water; seeds and plant of *Moricandia sonchifolia*; cuttings of *Artemisia, Hyssopus* and *Salvia*. MASSART, JEAN, Experimental Garden, Auderghem, Belgium; seeds of *Iris*. MASTERMAN, Mrs. L., Ascot; seeds of Tasmanian plants. MAXWELL & BEALE,

Ltd., Messrs., Broadstone, Dorset; plant of *Erica cinerea* 'Winifred Whitley.' MAYDON, Mrs. D., Bourton, Dorset; seeds of *Gordonia axillaris*. MILLARD, F. W., Felbridge, East Grinstead; cuttings of shrubs; collection of plants, chiefly for the rock garden. MITCHELL, W. J., Westonbirt, Tetbury; seedling plants of *Sorbus Sargentiana*. MITCHISON, R. C., Wootton, Isle of Wight; plants of *Solanum* and *Stapelia* species. MONCKTON, C. C. F., Jersey; plants of *Armeria corsica*. MONTEVIDEO PUBLIC PARKS, Uruguay; collection of seeds. MONTREAL BOTANIC GARDEN, Canada; collection of seeds. MOON, Mrs., Llanymynech, Mont.; plants from Kenya. MOONEY, Capt. G. K., Sevenoaks; plants for the rock garden. MORRISH, Mrs., London, S.W. 5; plant of *Gentiana asclepiadea*. MULLIGAN, B. O., Wisley; collection of seeds from Capri; cuttings of *Erica Tetralix* var. and *Quercus* × *hispanica*; seeds of *Campanula longestyla*. MURRELL, E., Ltd., Shrewsbury; collection of ten sorts of Roses, twelve plants of each. MUSGRAVE, C. T., Hascombe, Godalming; seeds of *Meconopsis, Mutisia* and *Anemone*; plants of *Mutisia speciosa, Primula Clarkei* and *P. Sherriffae*. NANKING BOTANIC GARDEN, China; collection of seeds, chiefly shrubs. NEMEC, Prof., Prague; seeds of *Lilium candidum*. NEW YORK BOTANIC GARDEN, U.S.A.; seeds from 1936 Rocky Mountains expedition; collection of rock plant and shrub seeds. NOTCUTT, R. C., Woodbridge, Suffolk; buds of *Prunus serrulata* 'Tai-haku'; plants of *Cytisus* × *Beanii, Viburnum* sp., *Syringa microphylla*; cuttings of *Berberis* and *Viburnum*. OGILVIE, L., Dundry, Bristol; cuttings of *Cytisus* × 'Porlock.' OTTAWA CENTRAL EXPERIMENTAL FARM, Canada; collection of seeds. OVERBECK, O., Salcombe, Devon; seeds of *Acacia* species, etc. PACK-BERESFORD, Lt.-Col., Golden Square, W. 1; plant of *Achimenes coccinea*; seeds of hybrid *Rhododendrons*. PAGE, COURTNEY, Haywards Heath; cuttings of *Rosa* species. PALESTINE, GOVERNMENT OF, AGRICULTURAL SERVICE; seeds of *Ranunculus asiaticus*. PALMER, Dr. E. J., Arnold Arboretum, Jamaica Plain, U.S.A.; collection of seeds of native trees and shrubs. PALMER, J. F., Coombs, B.C.; seeds of *Ceanothus* and *Sisyrinchium*. PAM, Major A., Broxbourne, Herts; corms of *Tritonia* 'Prince of Orange.' PARK, E. DICKSON, High Wycombe, Bucks; cuttings of *Dianthus Roysii*; plants of *Sonerila, Oxypetalum*; others for rock garden. PAUL, F., Botley, Hants; plant of semi-double *Pelargonium*. PHILLIPS, A. F., Pembury, near Tunbridge Wells; cuttings of *Juniperus* and *Viburnum*; plant of *Daphne* × *Burkwoodii*. POPOFF, Prof., Leningrad, U.S.S.R.; grafts of thirteen varieties of Pears. PORTER, G. P., West Moors, Dorset; collections of plants for the rock garden. PRESTON, F. G., Botanic Garden, Cambridge; cuttings of *Dianthus fruticosus*. PRESTON, K. B., Ripley, Surrey; seeds of *Boronia floribunda* and *Luffa*. PRESTON, Miss, Ottawa, Canada; collection of hybrid Lilacs and Crab-Apples. PRICE, Mrs., Nakuru, Kenya; seeds of *Delphinium*. PRICE, Sir H., Wakehurst, Ardingly, Sussex: plants of *Abeliophyllum* and *Camellia*; cuttings of *Juniperus squamata* var. *Wilsonii*. PYKE, J., Mexico; seeds of native plants. RAMSBOTTOM, J., Department of Botany, British Museum (Natural History); collection of seeds from S.E. Tibet, gathered by Messrs. Ludlow and Sherriff. REA, Lady, Liphook, Hants; seeds of *Embothrium coccineum*. REID, J., Carluke, Lanarkshire; plants of seedling Raspberry and Red Currant. REUTHE, G., Ltd., Keston, Kent; plants of *Rhododendron Grievii*. RIVERS & SON, Messrs. T., Sawbridgeworth, Herts; grafts of Apple 'Orleans Reinette'; cuttings of pink Boursault Rose. ROBERTS, Dr., Ottershaw, Surrey; seedlings of *Lasiopetalum dasyphyllum*; cuttings of *Sedum allantoides*; plants of four species of *Sedum*. ROBERTS, F., Wickford, Essex; trees of ten hybrid *Malus* and one purple-leaved Myrobalan Plum; grafts of three *Malus*. ROGERS, C. G. (the late), Etchingham, Sussex; seeds of *Kniphofia Rogersii, Lobelia* species and other Central African plants; plants of arborescent *Lobelia*. ROSENHEIM, P., East Molesey; collection of seeds of rock plants; seeds of *Iris xiphioides* and *Fritillaria imperalis Eduardii*. ROSSE, Lord, Birr, I.F.S.; collection of Bamboos and other plants. ROTHSCHILD, L. DE, Exbury House, Southampton; seeds of *Rhododendron* species and of shrubs; seeds and plants of *Berberis concinna*; plant of *Erica verticillata major*; collection of Rhododendrons for Battleston Hill. RUCK, Mrs., Machynlleth, Mont.; plant of Primula. RUSSELL, Messrs. L. R., Ltd., Windlesham, Surrey; plant of *Dipladenia atropurpurea*. ST. ANDREWS UNIVERSITY BOTANIC GARDEN, Scotland; collection of seeds. SANDEMAN, F. D. S., Kingennie, Angus; collection of *Primula, Meconopsis*, and other seeds. SCANTLEBURY, Mrs., Stanmore, Middx.; seeds of 'Perong' from Java. SCORGIE, A., Hythe, Kent; seeds and cuttings of *Sophora tetraptera*. SHELDON, W. G., Oxted, Surrey; plants of *Meconopsis, Primula, Kniphofia*, etc.; seeds of *Primula, Gentiana, Meconopsis* and other plants.

(*To be continued*)

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

MARCH 8, 1938.

A lecture was given by Mr. R. B. DAWSON on "The Upkeep of Garden Lawns."

Chairman, Prof. F. E. WEISS, D.Sc., LL.D., F.R.S., F.L.S.

SCIENTIFIC COMMITTEE.—Mr. A. D. COTTON, F.L.S., in the Chair, and five other members present.

The late Mr. F. J. Hanbury.—The Chairman referred to the death of Mr. F. J. Hanbury who had been a member of the Committee for many years. The Committee desired that a letter of sympathy should be sent to Mrs. Hanbury.

3-lobed Odontoglossum.—A well-marked specimen of this phenomenon in Odontoglossums was shown in which the column was also affected, being double.

Plants referred from Floral Committee B were named as *Primula amoena* and *Jasminum polyanthum*, the former of Mr. Ball's collecting in Asia Minor, the latter from Western China.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twelve other members present.

Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Apple 'Sanspareil.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Crawley Beauty' and 'Winter King.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:—

Gold Medal.

To Mr. G. H. Dalrymple, Bartley, for Freesias.

Silver-gilt Banksian Medal.

To Messrs. Dobbie, Edinburgh, for Daffodils and Hyacinths.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Bath, Wisbech, for Tulips, Daffodils, Hyacinths, etc.

Silver Banksian Medal.

To Messrs. Barr, London, for Daffodils, Crocuses and other bulbous plants.

To Messrs. Engelmann, Saffron Walden, for Carnations, Gerberas, Echeverias and Pansies.

To Messrs. Prins, Wisbech, for Daffodils, Tulips, Hyacinths.

To Messrs. Wakeley, London, for Daffodils, Crocuses and Hyacinths.

Flora Medal.

To Messrs. Low, Enfield, for Carnations.

To Messrs. Napier, Taunton, for Carnations.

To Messrs. Stewart, Ferndown, for Daffodils and other hardy plants.

Banksian Medal.

To Ashington Nurseries, Ashington, for Carnations.

Selected for trial at Wisley.

Primula malacoides 'Gladys Trehearne' from Mrs. Gladys Trehearne, Kenley.

Other Exhibits.

Mr. P. C. C. Crockford, Swindon: *Chrysanthemum maximum* plants.
Mrs. Warren Crowe, Henley-on-Thames: unnamed Cyclamen.
Mr. F. Everitt, Enfield Lock: Hippeastrums, Primulas, etc.
Messrs. Jefferies, Cirencester: Polyanthus.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. C. Elliott, Stevenage, for alpine plants in pans.
To Messrs. Waterer, Bagshot, for flowering trees and shrubs.

Silver-gilt Banksian Medal.

To Brookside Nurseries, Oxford, for a collection of Saxifrages.
To Messrs. Cheal, Crawley, for flowering trees and shrubs.

Silver Flora Medal.

To Messrs. Stuart Low, Enfield, for Camellias and other flowering shrubs.

Silver Lindley Medal.

To Mr. F. Barker, Stevenage, for an exhibit of varieties of *Primula Allionii*.

Silver Banksian Medal.

To Messrs. Hillier, Winchester, for flowering trees and shrubs.
To Knap Hill Nursery, Woking, for flowering trees and shrubs.
To Messrs. Russell, Windlesham, for flowering trees and shrubs.

Flora Medal.

To Hocker Edge Gardens, Cranbrook, for rock garden plants.
To Mr. E. Ladhams, Elstead, for rock garden plants.
To Messrs. Prichard, Christchurch, for rock garden plants.

Lindley Medal.

To T. T. Barnard, Esq., Wareham, for an exhibit of Cape bulbous plants.

Banksian Medal.

To Alpine Nurseries, West Moors, for rock garden plants.
To Mr. E. Ballard, Colwall, for rock garden plants.
To Messrs. Bedford & Page, Cambridge, for rock garden plants.
To Messrs. Cheal, Crawley, for rock garden plants.
To Dartington Hall, Ltd., Totnes, for rock garden plants.
To Messrs. Hollamby, Groombridge, for flowering shrubs.
To Mr. R. Kaye, Silverdale, for rock garden plants.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Mr. L. Lawrence, Taplow, for succulents.
To Letchworth Plants, Ltd., for rock garden plants.
To Marsden Nurseries, Ashtead, for hardy plants.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. Reuthe, Keston, for flowering shrubs.
To Messrs. Waterer, Twyford, for rock garden plants.
To Mr. G. Welch, Cambridge, for rock garden plants.
To White House Gardens, Abergavenny, for rock garden plants.
To Messrs. Wm. Wood, Taplow, for rock garden plants.

Award of Merit.

To *Primula amoena* as a hardy flowering border plant (votes 15 for), from Major F. C. Stern, O.B.E., M.C., Goring-by-Sea. See p. 244.

To *Strelitzia Reginae* as a flowering plant for the cool house (votes unanimous), from Mrs. Percy-Jones, Orpington. See p. 245.

Preliminary Commendation.

To *Jasminum polyanthum* as a half-hardy flowering shrub (votes unanimous), from Dame Alice Godman, D.B.E., Horsham.

Other Exhibits.

Abercorn Nurseries, Chelmsford: rock garden plants.
Messrs. Burkwood & Skipwith, Kingston: flowering shrubs.
Chez Nous Nurseries, Newick: rock garden plants.
Messrs. Constable, Southborough: bulbous plants.
Mr. A. Corderoy, Eltham: rock garden plants.
Mrs. Vera Higgins, Croydon: *Crassula Gillii*.
Orchard Neville Nurseries, Glastonbury: rock garden plants.
Messrs. Redgrove & Patrick, Sevenoaks: rock garden plants.
Messrs. Rogers, Southampton: rock garden plants.

Messrs. Russell, Windlesham: *Pavonia rosea*, *Bougainvillaea* 'Orange King,' *B.* 'Lady Hudson.'
Messrs. Southgate, New Malden: succulents.
Waterperry School of Horticulture, Oxford: rock garden plants.
Mr. R. Colpoys Wood, West Drayton: hardy shrubs.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., V.M.H., in the Chair, and sixteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Charlesworth, Haywards Heath, for a group of Orchids.
To Messrs. Sanders, St. Albans, for a group of Orchids.

Silver Banksian Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group of Orchids.
To Messrs. Black & Flory, Slough, for a group of Orchids.
To Messrs. Stuart Low, Jarvisbrook, for a group of Orchids.
To Messrs. H. G. Alexander, Tetbury, for a group of Orchids.
To Messrs. McBean, Cooksbridge, for a group of Orchids.

Award of Merit.

To *Odontioglossum* × 'Waveney' ('Dodeham' × *harvengtense*) (votes unanimous), from Messrs. Stuart Low. See p. 244.

To *Cymbidium* × 'Ramboda' var. 'Monarch' ('Pearl' × 'Venus') (votes 11 for, 4 against), from the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey. See p. 242.

To *Cymbidium* × 'Rio-Rita' ('Pearl' × 'Ruby') (votes unanimous), from Messrs. McBean. See p. 243.

To *Odontonia* × 'Rêve de Jour' (*Odontoglossum* × 'Rêve d'Or' × *Odontonia* × 'Ophelia') (votes 11 for, 4 against), from H. S. Wharton, Esq., 12 Templewood Avenue, Hampstead. See p. 244.

To *Odontioda* × 'Acida' (*Odontioda* × 'Acis' × *Odontioda* × 'Florida') (votes 10 for, 5 against), from Messrs. Charlesworth. See p. 244.

Other Exhibits.

N. S. Holland, Esq., Saxbys, Cowden: *Cymbidium* × 'Stella.'
G. P. Harben, Esq., Kings Somborne: *Cymbidium* hybrids.
Sir William Cooke, Bart., Hampstead Norris: *Cypripedium* × 'Blendia.'
N. M. Jensen, Esq., Roehampton: *Cymbidium* × 'Madonna.'

NARCISSUS AND TULIP COMMITTEE.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver-gilt Flora Medal.

To Messrs. The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils.

Silver Banksian Medal.

To Messrs. Barr, 12 King Street, Covent Garden, W.C. 2, for an exhibit of Daffodils.
To Mr. R. F. Calvert, Coverack, Cornwall, for an exhibit of Daffodils.
To Messrs. Carters Tested Seeds, Raynes Park, for an exhibit of Daffodils.
To Messrs. J. R. Pearson, Lowdham, for an exhibit of Daffodils in bowls.

Award of Merit.

To *Narcissus* 'Huntercombe' as a variety for exhibition (votes 9 for, 1 against). Raised and shown by Mrs. R. S. Cobley, Chircombe, Bideford. See p. 243.

Other Exhibits.

Mrs. R. S. Cobley: *Narcissus* 'Beltane' and a seedling numbered Ch. 736.
Mr. R. F. Calvert: *Narcissus* 'Madron.'
Messrs. H. Prins, Wisbech: *Narcissus* 'Prins's Giant.'

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON in the Chair, and sixteen other members present.

Awards Recommended:—

First-class Certificate.

To *Rhododendron Macabeanum* (votes unanimous), from Lt.-Col. E. H. W. Bolitho, Trengwainton, Cornwall. See p. 245.

Award of Merit.

To *R.* × ' Seagull ' (votes 10 for, 4 against), from Lady Loder, Leonardslee, Horsham, Sussex. See p. 245.

Other Exhibits.

Lord Aberconway, Bodnant, N. Wales : *R.* × ' Valpinense ' (*R. moupinense* × *R. Valentinianum*).

Capt. A. E. Hardy, Sandling Park, Hythe, Kent : *R. fulgens* (**A.M.** 1933).

Capt. A. M. Talbot Fletcher, Margam Castle, Port Talbot : *R. calophytum* (**F.C.C.** 1933), *R. commodum* (**A.M.** 1937), and *R. mallotum* (**A.M.** 1933).

Admiral Walker-Heneage-Vivian, Clyne Castle, Blackpill, Swansea : *R. niphargum* (R. 59623).

Lt.-Col. E. H. W. Bolitho : *R. recurvoides.*

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, F.L.S., in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To *Hepatica* × *media Ballardii* as a flowering plant for the rock garden (votes 10 for, 1 against), from Ernest Ballard, Esq., Colwall, Malvern. See p. 243.

To *Primula Clusiana* as a flowering plant for the rock garden (votes 10 for, 1 against), from G. P. Baker, Esq., Sevenoaks. See p. 244.

Other Exhibits.

N. G. Baguley, Esq., Banstead : *Draba bryoides.*

Mrs. J. D. North, Bridgnorth : *Narcissus Bulbocodium* form.

Lt.-Col. C. H. Grey, Cranbrook : *Hypoxis stellata elegans.*

Messrs. Bedford & Page, Trumpington, Cambridge : *Asphodelus acaulis.*

G. P. Baker, Esq., Sevenoaks : *Narcissus Bulbocodium* form.

Mrs. A. N. Griffith, Newnham, Cambridge : *Epigaea asiatica.*

MARCH 22, 1938.

CYMBIDIUM TROPHY COMPETITION.

The Cymbidium Trophy for the best exhibit of twelve Cymbidium plants, species, and/or hybrids was awarded to the Hon. H. S. Tufton, Englefield Green.

CYMBIDIUM CUP COMPETITION.

The Cymbidium Cup, for the best Cymbidium, old or new, was awarded to Messrs. H. G. Alexander, Ltd., Westonbirt, for *Cymbidium* ' Pharos ' var. ' Paragon.'

A lecture was given by Mr. P. M. SYNGE on " Plant Hunting on the Mountains of the Moon."

Chairman : Sir DANIEL HALL, K.C.B., LL.D., D.Sc., F.R.S., V.M.H.

SCIENTIFIC COMMITTEE.—Mr. A. D. COTTON, F.L.S., in the Chair, and five other members present.

Curious growth of Potato.—Mr. Marsden-Jones showed on behalf of Commander Hallett some potatos which had been kept dry on a shelf for two years, and which showed growth similar to that in the potatos shown by Mr. Robinson on January 25 last.

Diseased Narcissi.—Mr. A. B. Jackson showed bulbs of Narcissi which had failed to root and were attacked by *Botrytis narcissicola*, the large black sclerotia of which were abundant in the basal parts of the bulbs.

Effect of nicotine fumigation.—Mr. T. T. Barnard of Wareham sent flowers of *Gladiolus carinatus* in which the yellow had been changed to scarlet as an effect of fumigation with nicotine.

Scilla sp.—A species of Scilla referred from Floral Committee B and exhibited by Lady Lawrence was taken by Mr. Cotton who later reported that it appeared to be an unnamed species belonging to a group of Scilla as yet incompletely known. It had small flowers in a few-flowered raceme and rather wide variegated leaves.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and eleven other members present.

Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Apples 'Beauty of Kent,' 'Benoni,' 'Claygate Pearmain' and 'King of Tomkins County.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Birken' and 'Galloway Pippin.'

FLORAL COMMITTEE A.—Mr. W. R. OLDHAM, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Low, Enfield, for Carnations and other greenhouse plants.

Silver Banksian Medal.

To Messrs. Barr, London, for Daffodils and other hardy plants.

To Mr. G. H. Dalrymple, Bartley, for Freesias.

To Messrs. Engelmann, Saffron Walden, for Carnations, Gerberas, Pansies.

Flora Medal.

To Messrs. Bath, Wisbech, for Daffodils, Tulips, Irises.

To Messrs. Wakeley, London, for Hyacinths.

Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Polyanthus and Blue Primroses.

To Messrs. Prins, Wisbech, for Hyacinths, Tulips, Daffodils.

To Messrs. Toogood, Southampton, for Cinerarias.

Award of Merit.

To *Anthurium Andraeanum* 'Cupid' as a stove plant (votes unanimous), from James A. de Rothschild, Esq., M.P., Aylesbury (gr. Mr. G. F. Johnson). See p. 242.

To *Anthurium Andraeanum* 'Master Maximilian' as a stove plant (votes unanimous), from James A. de Rothschild, Esq., M.P. See p. 242.

To *Anthurium Andraeanum* 'Phoenix' as a stove plant (votes 14 for, 1 against), from James A. de Rothschild, Esq., M.P. See p. 242.

To *Anthurium Andraeanum* 'Rubrum' as a stove plant (votes unanimous), from James A. de Rothschild, Esq., M.P. See p. 242.

Selected for trial at Wisley.

Myosotis 'Caroline Pott,' from Messrs. Jones, Whitchurch.

Primula obconica 'Double,' from M. Doughty Browne, Esq., Bournemouth.

Other Exhibits.

Mr. F. Everitt, Enfield Lock: Hippeastrums and Primulas.

Messrs. Konynenburg & Mark, Noordwyk, Holland: *Myosotis oblongata grandiflora* 'Ultramarin' and *Richardia africana* 'White Giant.'

Merivale Nurseries, Sandon: Primroses.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Gold Medal.

To Messrs. Waterer, Bagshot, for Cherries, Crabs and other flowering trees.

Silver-gilt Banksian Medal.

To Messrs. Hillier, Winchester, for flowering trees and shrubs.

Silver Flora Medal.

To Messrs. Cheal, Crawley, for flowering trees and shrubs.

To Messrs. Russell, Windlesham, for flowering trees and shrubs.

Silver Banksian Medal.

To Brookside Nurseries, Oxford, for Primulas and other alpine plants.

To Messrs. C. Elliott, Stevenage, for Saxifrages and other alpine plants.

To Hocker Edge Gardens, Cranbrook, for rock garden plants.

To Knap Hill Nursery, Woking, for flowering trees and shrubs.

Lindley Medal.

To C. R. Scrase-Dickins, Esq., Horsham, for Rhododendrons and other shrubs.

Flora Medal.
To Alpine Nurseries, West Moors, for rock garden plants.
To Messrs. Constable, Southborough, for Lilies and other bulbous plants.
To Mr. E. Ladhams, Elstead, for rock garden plants.
To Messrs. Neale, Worthing, for succulents.
To Messrs. Prichard, Christchurch, for rock garden plants.
To Messrs. Reuthe, Keston, for flowering shrubs.
To Messrs. Waterer, Twyford, for rock garden plants.
To Mr. G. Welch, Cambridge, for rock garden plants.
To Messrs. Wood, Taplow, for rock garden plants.

Banksian Medal.
To Messrs. Bedford & Page, Cambridge, for rock garden plants.
To Messrs. Burkwood & Skipwith, Kingston, for flowering shrubs.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Marsden Nurseries, Ashtead, for rock garden plants.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. Rogers, Southampton, for rock garden plants.
To Messrs. Southgate, New Malden, for succulents.

Award of Merit.
To *Chorizema cordatum splendens* as a flowering shrub for the cool house (votes unanimous), from Messrs. Russell, Windlesham. See p. 242.

Other Exhibits.
Abercorn Nurseries, Chelmsford : rock garden plants.
T. T. Barnard, Esq., Wareham : *Gladiolus carinatus.*
Chez Nous Nurseries, Newick : rock garden plants.
Mr. A. Corderoy, Eltham : rock garden plants.
Messrs. Feilden & Crouch, Wrotham : rock garden plants.
Mrs. Hopkinson, Coulsdon : rock garden plants.
Mr. L. Lawrence, Taplow : succulents.
Letchworth Plants, Ltd. : rock garden plants.
Messrs. Redgrove & Patrick, Sevenoaks : rock garden plants.
L. de Rothschild, Esq., Exbury : *Acacia dealbata.*
White House Gardens, Abergavenny : rock garden plants.
Mr. R. Colpoys Wood, West Drayton : hardy shrubs.

ORCHID COMMITTEE.—LIONEL DE ROTHSCHILD, Esq., in the Chair, and sixteen other members present.

Awards Recommended :—

Gold Medal.
To Messrs. McBean, Cooksbridge, for Cymbidiums.

Silver-gilt Flora Medal.
To Guy P. Harben, Esq., King's Somborne, Hants, for Cymbidiums.
To Messrs. H. G. Alexander, Tetbury, for a group of Orchids.

Silver Lindley Medal.
To Lionel de Rothschild, Esq., Exbury, for Cymbidiums.

Silver Banksian Medal.
To Messrs. Charlesworth, Haywards Heath, for a group of Orchids.
To Messrs. Armstrong & Brown, Tunbridge Wells, for a group of Orchids.
To Messrs. Sanders, St. Albans, for Cymbidiums.

Banksian Medal.
To Messrs. Stuart Low, Jarvis Brook, for a group of Orchids.

Award of Merit.
To *Angraecum superbum* (votes 13 for, 1 against), from the Rt. Hon. Lord Methuen, Corsham Court, Wilts. See p. 242.

To *Cymbidium* × 'Pharos' var. 'Paragon' ('Flamingo' × 'Warbler') (votes unanimous), from Messrs. H. G. Alexander, Tetbury, Glos. See p. 242.

To *Miltonia* × 'Melina' var. 'Vivid' ('Memoria H. T. Pitt' × 'Mrs. J. B. Crum') (votes 13 for, 1 against), from Messrs. McBean, Cooksbridge. See p. 243.

To *Cymbidium* × 'Edzell' var. 'John Linford' ('Ceres' × 'Lysander') (votes 13 for, 1 against), from the Hon. H. S. Tufton, Castle Hill, Englefield Green, Surrey. See p. 242.

To *Vuylstekeara* × 'Rosalie' var. 'Shalston' (*Odontonia* × 'Duchess of York' × *Odontioda* × 'Laura') (votes unanimous), from H. S. Wharton, Esq., Templewood Ave., Hampstead. See p. 245.

Other Exhibits.
Messrs. Harry Dixon, Wandsworth : a group of Orchids.
The Lady Leconfield, Petworth, Sussex : *Orchis papilionacea.*

NARCISSUS AND TULIP COMMITTEE.—Mr. G. W. Leak, V.M.H., in the Chair, and sixteen other members present.

Awards Recommended :—

Gold Medal.

To Mr. J. L. Richardson, Prospect House, Waterford, for an exhibit of Daffodils.

To Lord Rendlesham, Bosloe, Mawnan, Falmouth, Cornwall, for an exhibit of Daffodils.

Silver-gilt Flora Medal.

To Messrs. Dobbie, Edinburgh, for an exhibit of Tulips.

To Mr. R. F. Calvert, Carnsulan, Coverack, Cornwall, for an exhibit of Daffodils.

Silver-gilt Banksian Medal.

To Messrs. Carters Tested Seeds, Ltd., Raynes Park, for an exhibit of Daffodils in pots and bowls.

To the Trenoweth Valley Flower Farm, St. Keverne, Cornwall, for an exhibit of Daffodils.

Silver Flora Medal.

To the Donard Nursery Company, Newcastle, Co. Down, for an exhibit of Daffodils.

To Mr. G. H. Furness, Berrow, Somerset, for an exhibit of Daffodils.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, for an exhibit of Daffodils.

Silver Banksian Medal.

To Messrs. Barr, 12 King Street, Covent Garden, W.C. 2, for an exhibit of Daffodils.

To Messrs. J. R. Pearson, Lowdham, for an exhibit of Daffodils in bowls.

First-class Certificate.

To *Narcissus* ' Polindra ' as a variety for exhibition (votes 12 for), from Mr. J. L. Richardson. See p. 243.

Award of Merit.

To *Narcissus* ' Fairy Wings ' as a variety for the alpine house (votes unanimous), from Mr. G. S. Crouch, Fairseat Nurseries, Wrotham, Kent. See p. 243.

To *Narcissus* ' Monaco ' as a variety for exhibition (votes 8 for, 4 against), from Mr. J. L. Richardson. See p. 243.

To *Narcissus* ' St. Issey ' as a variety for exhibition (votes unanimous), from Mr. J. L. Richardson. See p. 244.

To *Narcissus triandrus aurantiacus* as a variety for the alpine house (votes unanimous), from Miss C. Christie-Miller, Swyncombe House, Henley-on-Thames. See p. 244.

Selected for Trial at Wisley.

Narcissus ' Fairy Wings,' from Mr. G. S. Crouch.

Narcissus ' Poise,' from Mrs. R. S. Cobley, Chircombe, Bideford, Devon.

Narcissus ' Cinnamon,' from Mrs. R. S. Cobley.

Variety to be seen again.

The Committee expressed a desire to see at a future meeting *Narcissus* ' Brunswick,' shown by Mr. J. L. Richardson.

Other Exhibits.

Mrs. R. S. Cobley, Bideford : *Narcissus* ' Dandelion ' and ' Constance Morel.'

The Classification of Narcissus ' Roxane.'

It was reported that seven flowers of *Narcissus* ' Roxane,' sent to the Secretary by Messrs. Barr, all conformed to the specification of Division I. Six young flowers of the variety, grown at Wisley, were before the Committee. These varied, but five had the corona as long as or longer than the perianth segments. It was decided that the variety should be classified as belonging to Division Ib.

The Peter Barr Memorial Cup.

It was unanimously recommended that the Peter Barr Memorial Cup be awarded to Professor Dr. E. van Slogteren, Director of the Bulb Research Station, Lisse, Holland.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. Stevenson in the Chair, and nineteen other members present.

Awards Recommended :—

First-class Certificate.

To *Rhododendron lutescens*, Exbury var. (votes unanimous), from Lionel de Rothschild, Esq., Exbury House, Southampton. See p. 244.

Award of Merit.

To *R.* × ' White Glory,' Leonardslee var. (votes 12 for, 1 against), from Dame Alice Godman, South Lodge, Horsham. See p. 245.

Other Exhibits.

Major C. G. Coe, Windlesham Hall, Windlesham, Surrey: *R. bullatum* (K.W. 6793) (**F.C.C.** 1937).

Dame Alice Godman: *R. calophytum* (**F.C.C.** 1933), *R.* hybrid (*R. campanulatum* × *R. Campbelliae*), *R. sp.* of Grande series.

Admiral Walker-Heneage-Vivian, Clyne Castle, Swansea: R. × ' Pink Glory ' (*R.* × ' Glory of Penjerrick ' × *R.* × *Loderi*).

W. Whitaker, Esq., Pylewell Park, Lymington: *R.* × ' Calthom ' (*R. calophytum* × *R. Thomsonii*).

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. C. T. Musgrave, V.M.H., in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To *Leucojum trichophyllum* as a flowering plant for the alpine house (votes 6 for), from Lt.-Col. C. H. Grey, Cranbrook.

To *Viola sarmentosa* as a flowering plant for the alpine house (votes 6 for), from The Viscountess Byng of Vimy, Thorpe-le-Soken.

Other Exhibits.

Mr. E. Ladhams, Elstead: *Erysimum capitatum.*

Alpine Nurseries, Ltd., West Moors: *Iris albanica.*

Mr. G. S. Crouch, Wrotham, Kent: *Primula* ' Babs.'

Mrs. G. Anley, Woking: *Aethionema creticum* ?

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Mr. G. Monro, C.B.E., V.M.H., in the Chair, and seven other members present.

Exhibit.

Carnation ' White Baroness ' (to be seen again), shown by S. J. Hose, Esq., Tilgates, Bletchingley, Surrey.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

MARCH 29, 1938.

JOINT ROCK GARDEN PLANT COMMITTEE (at Alpine Garden Society's Show).—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Award of Merit.

To *Anemone blanda Ingramii* as a flowering plant for the rock garden (votes unanimous), from Alpine Nurseries, Ltd., West Moors, Dorset. See p. 291.

To *Cassiope rigida* as a flowering plant for the rock garden (votes unanimous), from Mrs. A. N. Griffith, Paradise House, Cambridge. See p. 291.

To *Corydalis cashmeriana* as a flowering plant for the alpine house (votes unanimous), from A. N. Griffith, Esq., Paradise House, Cambridge. See p. 292.

To *Daphne collina* as a flowering plant for the alpine house (votes unanimous), from A. N. Griffith, Esq. See p. 292.

To *Draba mollissima* as a flowering plant for the alpine house (votes 8 for), from Dr. P. L. Giuseppi, Trevose, Felixstowe. See p. 292.

To *Erysimum capitatum* as a flowering plant for the alpine house (votes 7 for, 1 against), from Miss E. A. Britton, Tiverton. See p. 292.

To *Fritillaria latifolia nobilis* as a flowering plant for the alpine house (votes 7 for, 1 against), from Dr. P. L. Giuseppi. See p. 292.

To *Ledum nipponicum* as a flowering plant for the alpine house (votes unanimous), from Alpine Nurseries, Ltd., West Moors, Dorset. See p. 292.

To *Lithospermum oleifolium* as a flowering plant for the alpine house (votes 9 for), from Mrs. G. Anley, Woking. See p. 293.

To *Phyllodoce caerulea* as a flowering plant for the rock garden (votes 8 for), from R. B. Cooke, Esq., Corbridge, Northumberland. See p. 295.

To *Phyllodoce caerulea*, Japanese form, as a flowering plant for the rock garden (votes unanimous), from R. B. Cooke, Esq. See p. 295.

To *Phyllodoce nipponica* as a flowering plant for the alpine house (votes 6 for), from Messrs. W. E. Th. Ingwersen, East Grinstead. See p. 295.

To *Primula Calderiana* as a flowering plant for the alpine house (votes 6 for), from R. B. Cooke, Esq. See p. 295.

To *Primula kisoana* as a flowering plant for the rock garden (votes unanimous), from Lt.-Col. C. H. Grey, Hocker Edge Gardens, Cranbrook, and A. N. Griffith, Esq. See p. 295.

To *Primula veris macrocalyx* as a flowering plant for the rock garden (votes unanimous), from A. N. Griffith, Esq., Cambridge. See p. 296.

To *Sedum spathulifolium* 'Capablanca' as a flowering plant for the alpine house (votes 7 for, 1 against), from Alpine Nurseries, Ltd. See p. 297.

To *Shortia uniflora grandiflora rubens* as a flowering plant for the rock garden (votes unanimous), from Mr. W. J. Marchant, Stapehill, Wimborne. See p. 297.

Preliminary Commendation.

To *Anchusa caespitosa* as a flowering plant for the alpine house (votes unanimous), from P. Davis, Esq., East Grinstead.

To *Omphalodes rupestris* as a flowering plant for the alpine house (votes unanimous), from Dr. P. L. Giuseppi, Felixstowe.

Cultural Commendation.

To T. West, Esq., Merstham, for *Pyxidanthera barbulata.*

Other Exhibits.

Mrs. G. Anley, Woking: *Ficus stipulata* var. *minima, Iris cretica, Salix reticulata.*

Dr. R. Bevan, Henley-on-Thames: *Fritillaria pallidiflora* (**F.C.C.** 1887).

Mr. Stuart Boothman, Maidenhead: *Douglasia montana, Gentiana verna* 'Amy Baring,' *Phacelia sericea, Townsendia exscapa.*

Miss E. A. Britton, Tiverton: *Corydalis aurea.*

R. B. Cooke, Esq., Corbridge: *Rhododendron pemakoense* (**A.M.** 1933).

F. D. Goodchild, Esq., Beckenham: *Saxifraga* × *Gusmusii, Saxifraga porophylla montenegrina, S. porophylla Sibthorpiana.*

Dr. P. L. Giuseppi, Felixstowe: *Androsace carnea, Bongardia Chrysogonum (Rauwolfii), Leucocrinum montanum* (**A.M.** 1901), *Narcissus scaberulus* (**B.C.** 1932), *Primula Clarkei* (**P.C.** 1936), *Silene pennsylvanica, Tulipa cretica* (**B.C.** 1930), *Vaccinium Nummularia* (**A.M.** 1932).

Lt.-Col. C. H. Grey, D.S.O., Cranbrook: *Primula Reinii* (**A.M.** 1915), *Ranunculus* × *Arendsii* (**A.M.** 1935).

A. N. Griffith, Esq., Cambridge: *Arcterica nana* (**A.M.** 1924), *Rhododendron pemakoense* (**A.M.** 1933), *Saxifraga Mertensiana, Synthyris Sweetzeri (reniformis).*

Miss D. C. Hopton, Bartestree: *Eunomia oppositifolia.*

Messrs. W. E. Th. Ingwersen, East Grinstead: *Cyathodes Colensoi, Erigeron aureus* (**A.M.** 1936).

Dr. N. W. Jenkin, Hindhead: *Daphne tangutica* (**A.M.** 1920).

Capt. H. P. Leschellas, M.B.E., Prestbury: *Androsace argentea* (**A.M.** 1930), *Polemonium confertum melittum* (**A.M.** 1900), *Veronica pulvinaria.*

Lady Lawrence, Dorking: *Aquilegia saxemontana.*

Miss D. Lowe, Hinton St. George: *Iris attica, Ramondia Nathaliae* (**A.M.** 1929).

Mr. W. J. Marchant, Wimborne: *Epigaea* × 'Aurora.'

G. A. Mooney, Esq., Sevenoaks: *Myosotis uniflora, Oreocharis Forrestii.*

Dr. H. Roger-Smith, Capel: *Soldanella carpatica.*

Miss K. M. Shaw, Cardiff: *Sempervivum atlanticum, Viola septentrionalis.*

Mrs. Talbot, Winchester: *Albuca minor, Leucojum nicoense.*

T. West, Esq., Merstham: *Saxifraga diapensioides* (**A.M.** 1933).

APRIL 5, 1938.

SEWELL MEDAL COMPETITION.

Amateurs' Medal.

To Mark Fenwick, Esq., V.M.H., Abbotswood, Stow-on-the-Wold (Gardener Mr. F. Tustin.)

Trade Growers' Medal.

Messrs. The Brookside Nurseries, Ltd., Headington.

A lecture on "Plant-hunting in China," by Professor Hu, was read in his absence by Professor Sir WM. WRIGHT SMITH, V.M.H.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.H.S., V.M.H., in the Chair, and six other members present.

Bud sport of Pear.—Mr. M. B. Crane showed photographs and drawings of a fruit of a bud-sport of the Pear 'Fertility' selected by Messrs. Seabrook, which had proved to be tetraploid. The fruit was about twice as large as normal. He reported that a similar bud-sport had arisen in America in the variety 'Williams' Bon Chrétien.'

Bud sport in Rubus.—He also showed illustrations of a bud sport in the Mahdi Berry, where a pentaploid form had been derived from a triploid, and the result of a cross between the tetraploid *Rubus Idaeus* and *R. hircinus* which had produced something closely akin to the Loganberry.

Double-spathed Arum.—Mrs. Fletcher of Abbots Ann, Andover, sent an Arum with a double spathe.

Plants for name were identified as *Daphne petraea* and *Pachyphytum viride.*

A Conference regarding *Lygus pratensis* attack on Chrysanthemums took place in the Lecture Room of the New Hall, attended by many growers who related their experiences. A summary, etc., is in preparation.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Apples 'Claygate Pearmain,' 'Saltcote Pippin,' and 'Wagener.'

Mr. C. J. Gleed, 78 St. Cross Road, Winchester: Apple 'Whitfield Seedling.'

Mr. W. F. Turner, Allnuts, Sotwell, Wallingford: Apple 'Sotwell Surprise.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Baldwin,' 'Bowden's Seedling,' 'Sir John Thornycroft,' and 'Taunton Cross.'

Samples of fruit from the South African Fruits in Season Exhibit, staged by The Imperial Fruit Show, Ltd.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Blackmore & Langdon, Bath, for Polyanthus.

Silver Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, Pansies and Gerberas.

Flora Medal.

To Mr. J. Douglas, Great Bookham, for Auriculas.

To Messrs. Sutton, Reading, for Primroses.

Banksian Medal.

To Mr. A. Corderoy, Eltham, for hardy Primulas.

To Messrs. Low, Enfield, for Carnations.

Cultural Commendation.

To Mr. F. T. Bradley, Gardener to Francis Glyn, Esq., Much Hadham, for Hippeastrum 'Maud.' A large dark crimson variety of short stature.

The following awards were recommended after trial at Wisley:

Award of Merit.

To Primula 'E. R. Janes,' from Messrs. Prichard, Christchurch. See p. 295.

To Primula 'Nancy Lansdell,' from Mr. F. J. Lansdell, Brighton. See p. 296.

Other Exhibits.

Mrs. Bucknall, Doneraile: Anemones.

R. F. W. Cartwright, Esq., Banbury: Hippeastrum 'Red King.'

Dean Gardens, Longniddry: Polyanthus and Primroses.

Mr. T. Everitt, Enfield Lock: Hippeastrums, etc.

W. Halcot Hingston, Esq., Sanderstead: Myosotis 'Elspeth.'

H. G. E. Johnson, Esq., Bournemouth: Aubrietia 'Coronation.'

Merivale Nurseries, Sandon: Primroses and Polyanthus.

Mrs. Maurice Pope, Chippenham: Cape Pelargoniums.

Mr. W. Yandell, Maidenhead: Violas.

FLORAL COMMITTEE B.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and twenty other members present.

Awards Recommended:—

Silver-gilt Banksian Medal.

To Messrs. Waterer, Bagshot, for Cherries, Crabs and other flowering trees.

Silver Flora Medal.

To Messrs. Hillier, Winchester, for flowering trees and shrubs.

To Messrs. Notcutt, Woodbridge, for flowering shrubs.

To Messrs. Russell, Windlesham, for greenhouse foliage plants.

Silver Banksian Medal.

To Messrs. Stuart Low, Enfield, for Camellias and other flowering shrubs.

Lindley Medal.

To Mr. W. J. Marchant, Wimborne, for rock garden shrubs.

Flora Medal.

To Brookside Nurseries, Oxford, for rock garden plants.

To Messrs. Elliott, Stevenage, for rock garden plants.

To Hocker Edge Gardens, Cranbrook, for bulbous and rock garden plants.

To Messrs. Hollamby, Groombridge, for flowering shrubs.

To Knap Hill Nursery, Woking, for flowering shrubs.

To Messrs. Prichard, Christchurch, for rock garden plants.
To Messrs. Waterer, Twyford, for rock garden plants.

Banksian Medal.

To Alpine Nurseries, West Moors, for rock garden plants.
To Messrs. Barr, Taplow, for bulbous plants.
To Messrs. Bedford & Page, Cambridge, for rock garden plants.
To Messrs. Burkwood & Skipwith, Kingston, for flowering shrubs.
To Messrs. Constable, Southborough, for bulbous plants.
To Dartington Hall, Ltd., Totnes, for rock garden plants.
To Mr. E. Ladhams, Elstead, for rock garden plants.
To Marsden Nurseries, Ashtead, for rock garden plants.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. Reuthe, Keston, for flowering shrubs.
To Messrs. Rogers, Southampton, for rock garden plants.
To Tregrehan Nurseries, Par, for Camellias and Rhododendrons.
To Mr. G. Welch, Cambridge, for rock garden plants.

Award of Merit.

To *Amelanchier oblongifolia* as a hardy flowering shrub (votes 11 for, 3 against), from Mr. W. J. Marchant, Wimborne. See p. 291.

To *Malus hupehensis* var. *rosea* as a hardy flowering tree (votes unanimous), from the Director, R.H.S. Gardens, Wisley. See p. 293.

To *Pieris floribunda* var. *elongata* as a hardy flowering shrub (votes unanimous), from Mr. W. J. Marchant, Wimborne. See p. 295.

To *Prunus subhirtella pendula fl. pl.* as a hardy flowering tree (votes unanimous), from Collingwood Ingram, Esq., Benenden. See p. 296.

To *Sophora macrocarpa* as a tender flowering shrub (votes 12 for), from Lord Aberconway, Bodnant. See p. 297.

Other Exhibits.

Abercorn Nurseries, Chelmsford : rock garden plants.
Mr. J. C. Allgrove, Slough : flowering Crabs.
Messrs. Baggesen, Pembury : flowering shrubs.
Col. A. E. Barchard, Uckfield : *Erica arborea* seedling.
F. H. A. Booth, Esq., Chiddingfold : *Prostanthera rotundifolia.*
Chez Nous Nurseries, Newick : rock garden plants.
Dartington Hall, Ltd., Totnes : rock garden plants.
Mrs. Vera Higgins, Croydon : *Pachyphytum viride, Greenovia aurea.*
Mrs. Hopkinson, Coulsdon : rock garden plants.
Collingwood Ingram, Esq., Benenden : Japanese Cherry ' Asano,' Japanese Cherry ' Taoyome Sakura.'
Mr. J. Klinkert, Richmond : clipped trees.
Messrs. Neale, Worthing : succulents.
Mrs. Maurice Pope, Chippenham : *Pelargonium sp., Forsythia suspensa atrocaulis.*
Sir John Ramsden, Bt., Gerrards Cross : *Nomocharis meleagrina.*
Messrs. Redgrove & Patrick, Sevenoaks : rock garden plants.
Messrs. Russell, Windlesham : Peach ' Russell's Weeping Pink.'
Messrs. Southgate, New Malden : succulents.
Lord Vivian, Bodmin : *Rhododendron russatum.*
Walton Park Nurseries, Walton : flowering trees and shrubs.
Major Wheler, Faversham : *Rhododendron* × *fragrantissimum.*
White House Gardens, Abergavenny : rock garden plants.
The Director, R.H.S. Gardens, Wisley : *Narcissus* ' Hawera.'
Mr. R. Colpoys Wood, West Drayton : flowering trees and shrubs.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and fourteen other members present.

Award Recommended :—

Award of Merit.

To *Angraecum rhodostictum* (votes 10 for, 4 against), from John St. Maur Ramsden, Esq., Bulstrode, Gerrard's Cross, Bucks. See p. 291.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group of Orchids.
Messrs. H. G. Alexander, Tetbury : a group of Orchids.
Messrs. J. & A. McBean, Cooksbridge : a group of Orchids.
Messrs. Armstrong & Brown, Tunbridge Wells : a group of Orchids.
R. J. Salmon, Esq., Winchmore Hill : *Cymbidium* × ' Madonna.'
E. Kenneth Wilson, Esq., Wimbledon : *Cymbidium* × ' Jason.'

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Gold Medal.

To Mr. J. L. Richardson, Prospect House, Waterford, for an exhibit of Daffodils.

Silver-gilt Flora Medal.

To Messrs. Barr, 11 King Street, Covent Garden, W.C. 2, for an exhibit of Daffodils.

To Lord Rendlesham, Bosloe, Mawnan, Falmouth, for an exhibit of Daffodils.

Silver-gilt Banksian Medal.

To Mr. G. H. Furness, Berrow, Somerset, for an exhibit of Daffodils.

To the Trenoweth Valley Flower Farm, Ltd., St. Keverne, for an exhibit of Daffodils.

Silver Flora Medal.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Daffodils.

To Mr. R. F. Calvert, Carnsulan, Coverack, Cornwall, for an exhibit of Daffodils.

Silver Banksian Medal.

To Messrs. Dobbie, Edinburgh, for an exhibit of Daffodils.

To Messrs. J. R. Pearson, Lowdham, for an exhibit of Daffodils.

To Messrs. Wakeley Bros., Bankside, S.E. 1, for an exhibit of Daffodils.

Flora Medal.

To Messrs. D. Stewart, Ferndown Nurseries, Wimborne, for an exhibit of Daffodils and Tulips.

Banksian Medal.

To Messrs. James Kelway, Langport, for an exhibit of Daffodils and Tulips.

First-class Certificate.

To *Narcissus* 'Carbineer' as a variety for exhibition (votes 11 for), from Mr. J. L. Richardson. See p. 293.

Daffodils selected for trial at Kirton.

The following were selected for trial at Kirton as varieties for garden decoration and for cutting from the open for market :—

Narcissus 'Carbineer,' shown by Mr. J. L. Richardson.

Narcissus 'Cheerio,' shown by A. M. Williams, Esq., Werrington Park, Launceston.

Narcissus 'Golden Perfection,' shown by Messrs. Farrow & Son, Holbeach St. Marks, Lincs.

Narcissus 'Velveteen,' shown by Major C. B. Habershon, Hesterworth, Ashton-on-Clun, Craven Arms, Shropshire.

Daffodils selected for trial at Wisley.

The last three of the above-mentioned Daffodils were also selected for trial at Wisley as varieties for garden decoration.

Daffodils to be seen again.

The Committee expressed a desire to have *Narcissus* 'Cheerio' exhibited at a future meeting.

Other Exhibits.

Messrs. Farrow & Son : Daffodils.

Mr. C. T. Felton, Blackgreen, St. Albans : Daffodils.

Mr. P. Lower, The Cottage, Carlton Road, Harpenden : Daffodils.

JOINT IRIS COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and five other members present.

Awards Recommended :—

Award of Merit.

Iris Wattii, as a tender plant (votes unanimous), shown by Lord Aberconway, Bodnant, North Wales. See p. 292.

Selected for trial at Wisley.

Iris 'Ultra,' shown by F. Wynn Hellings, Esq., Grove Way, Esher, Surrey.

Other Exhibit.

Mrs. H. P. Thomson, Dupfield, High Pine Close, Weybridge : *Iris Chamaeiris*, colour form.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON in the Chair, and thirteen other members present.

Awards Recommended :—

First-class Certificate.

To *Rhododendron* × 'Aries' (*R. neriiflorum* × *R. Thomsonii*) (votes unanimous), from Lionel de Rothschild, Esq., Exbury House, Southampton. See p. 296.

To *R.* × 'Avalanche' (*R. calophytum* × *R.* × *Loderi*) (votes unanimous), from Lionel de Rothschild, Esq. See p. 296.

To *R.* × 'Fortune' (*R. Falconeri* × *R. sinogrande*) (votes 10 for), from Lionel de Rothschild, Esq. See p. 296.

Award of Merit.

To *R.* × 'Avalanche' var. 'Alpine Glow' (*R. calophytum* × *R.* × *Loderi*) (votes unanimous), from Lionel de Rothschild, Esq. See p. 296.

To *R.* × 'Gay Lady' (*R.* × 'Cornubia' × *R. Griffithianum*) (votes 9 for), from Lady Loder, Leonardslee, Horsham, Sussex. See p. 297.

To *R. desquamatum*, Forrest's var. (F. 24535) (votes 13 for, 1 against), from Capt. A. M. Talbot Fletcher, Margam Castle, Port Talbot, Glamorganshire. See p. 296.

To *R.* × 'Rosalind' (*R.* × *Fargesii* × *R. Thomsonii*) (votes 7 for, 3 against), from Lord Aberconway, Bodnant, N. Wales. See p. 297.

To *R. Williamsianum* (votes 12 for), from Lord Aberconway. See p. 297.

Other Exhibits.

Lord Aberconway: *R.* × 'Aruna' (*R.* × 'Penjerrick' × *R. Wightii*), *R.* × 'Beauty of Tremough,' Bodnant form (*R. arboreum* × *R. Griffithianum*), and *R.* × 'Bluebird' (*R.* × *Augustinii* × *R. intricatum*) (to be seen again).

Capt. A. M. Talbot Fletcher: *R.* × 'Calomina' (*R. calophytum* × *R.* × 'Queen Wilhemina'), *R. charitopes*, and *R. laxiflorum*.

Lionel de Rothschild, Esq.: two forms of *R. chaetomallum*, both under No. F. 21850.

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, M.C., O.B.E, F.L.S., in the Chair, and eight other members present.

Awards Recommended :—

First-class Certificate.

To *Schizocodon macrophyllus* as a flowering plant for the rock garden (votes 6 for, 1 against), from Mr. W. J. Marchant, Stapehill, Wimborne. See p. 297.

Award of Merit.

To *Lithospermum prostratum var.* 'Grace Ward' as a flowering plant for the rock garden (votes unanimous), from Dartington Hall, Ltd., Totnes. See p. 293.

To *Orobus vernus roseus splendens* as a flowering plant for the rock garden (votes unanimous), from Mr. E. Ladhams, Godalming. See p. 295.

Other Exhibits.

Lord Aberconway, Bodnant: *Primula Wattii*.

Miss C. Beck, Great Amwell, Ware: *Fritillaria latifolia* var. *lutea*, *F. mutica*, *F. pontica*.

Messrs. Dartington Hall, Ltd., Totnes: *Primula Dubernardiana*.

Lt.-Col. C. H. Grey, Cranbrook: *Campanula tridentata* var. *stenophylla* E.K.B. 433, *Viola cucullata alba*.

Mr. W. J. Marchant, Stapehill: *Schizocodon soldanelloides carneus*.

Messrs. M. Prichard, Christchurch: *Primula denticulata* 'Sylvia Watson.'

Dr. F. Stoker, Loughton: *Primula petrocharis*.

Mrs. E. E. Winterbotham, Beaconsfield: *Daphne acutiloba*, *D. retusa*, *D. rupestris*.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. GEO. MONRO, C.B.E., V.M.H., in the Chair, and eight other members present.

Exhibit.

Carnation 'Giant Singer,' shown by Grant A. Singer, Esq., Yeoman's Court Gardens, Salisbury.

APRIL 12, 1938.

EARLY MARKET PRODUCE SHOW.

Chief Awards in the Competitive Classes.

Silver Cup for the most successful exhibitor.

To Mr. A. W. Secrett, Ham, Surrey.

Section 1. *Silver Knightian Medal* to the competitor gaining the highest number of points.
To Captain R. G. M. Wilson, Surfleet.

Knightian Medal to the competitor gaining the second highest number of points.
To Messrs. H. & A. Pullen Burry (1931), Ltd., Sompting.

Section 2. *Silver Knightian Medal* to the competitor gaining the highest number of points.
To Mr. A. W. Secrett, Ham, Surrey.

Knightian Medal to the competitor gaining the second highest number of points.
To Captain R. G. M. Wilson, Surfleet.
To Mr. George Rico, Goring-by-Sea. } Equal Second.
To Messrs. Ball & Luxmoore, Sundridge.

Section 3. *Silver Knightian Medal* to the competitor gaining the highest number of points.
To Mr. A. W. Secrett, Ham, Surrey.

Knightian Medal to the competitor gaining the second highest number of points.
To Messrs. W. G. White & Sons, Iver.

Section 6. *Silver Banksian Medal* to the competitor gaining the highest number of points.
To Mr. C. Robinson, Spalding.
To Messrs. J. T. White & Sons, Spalding. } Equal First.

A lecture was given by Mr. A. L. SIMON on "Unusual Vegetables for the Garden and the Cook." See p. 274.
Chairman, Mr. E. A. BUNYARD, F.L.S.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and fourteen other members present.

Awards Recommended:—

Gold Medal.
To the National Farmers' Union, Surrey Branch, for an exhibit of vegetables and flowers packed for market.
To Mr. A. W. Secrett, Manor Farm, Ham, Surrey, for an exhibit of vegetables packed for market.

Silver-gilt Knightian Medal.
To Leeds and District Gardeners' Association for an exhibit of Rhubarb packed for market.
To Mr. C. Robinson, Quadring, Spalding, for an exhibit of vegetables and flowers packed for market.
To Captain R. C. Wilson, Iceni Nurseries, Surfleet, Spalding, for an exhibit of vegetables and flowers packed for market.

Silver Knightian Medal.
To the Buckinghamshire Growers for an exhibit of vegetables and flowers packed for market.
To the Vale of Evesham Growers for an exhibit of vegetables packed for market.
To Mr. A. R. Wills, Romsey, Hants, for an exhibit of Hydrangeas and vegetables.

Bronze Knightian Medal.
To Messrs. Toogood, Southampton, for an exhibit of vegetables.

Silver Flora Medal.
To Messrs. Foxwells, Balcombe, Sussex, for an exhibit of Sweet Peas packed for market.
To Mr. J. Harnett, Tunfield Nursery, Hoddesdon, Herts, for an exhibit of Hydrangeas and Roses.

Other Exhibits.
Co-operative Exhibit: collection of vegetables, flowers, and fruit packed for market.
Messrs. Allwood, Haywards Heath: exhibit of Carnations packed for market.
Greatford Garden Company, Stamford, Lincs.: exhibit of Watercress.
National Farmers' Union (Watercress Section): exhibit of Watercress.

APRIL 12–13, 1938.

DAFFODIL SHOW.

Chief Awards in the Competitive Classes.

The Engleheart Challenge Cup and a Silver-gilt Flora Medal, for twelve varieties of Daffodils raised by the exhibitor.

To Mr. Guy L. Wilson, The Knockan, Broughshane, Co. Antrim.

Silver-gilt P. D. Williams Medal for the best exhibit of six varieties of Daffodils with red or orange colouring in the cup; Division II and/or Division III, three stems of each.

To Major C. B. Habershon, Hesterworth, Aston-on-Clun, Craven Arms, Shropshire.

Silver-gilt Banksian Medal for twelve varieties of Daffodils not in commerce.

To Mr. Guy L. Wilson.

The Banksian Medal offered for the best bloom shown in the competitive classes was awarded to Mr. J. L. Richardson, Prospect House, Waterford, for a bloom of *Narcissus* 'Ludlow.'

APRIL 12, 1938.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Gold Medal.

To Mr. J. L. Richardson, Prospect House, Waterford, for an exhibit of Daffodils.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, for an exhibit of Daffodils.

Silver-gilt Flora Medal.

To Messrs. Barr, 12 King Street, Covent Garden, W.C. 2, for an exhibit of Daffodils.

To The Donard Nursery Co., Newcastle, Co. Down, for an exhibit of Daffodils.

Silver-gilt Banksian Medal.

To Mr. R. F. Calvert, Carnsulan, Coverack, Cornwall, for an exhibit of Daffodils.

To Mr. G. H. Furness, Berrow, Somerset, for an exhibit of Daffodils.

Silver Flora Medal.

To Messrs. Heemskerk, Hillegom, Holland, for an exhibit of Daffodils.

To Messrs. J. R. Pearson, Lowdham, for an exhibit of Daffodils.

To Messrs. H. Prins, Wisbech, for an exhibit of Daffodils.

To Messrs. D. Stewart, Ferndown Nurseries, Wimborne, for an exhibit of Daffodils.

To The Trenoweth Valley Flower Farm, Ltd., St. Keverne, Cornwall, for an exhibit of Daffodils.

To Mr. A. M. Wilson, Presteigne, Radnorshire, for an exhibit of Daffodils.

Silver Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Daffodils.

To Messrs. Dobbie, Edinburgh, for an exhibit of Daffodils.

To Messrs. Wakeley, Bankside, S.E. 1, for an exhibit of Daffodils.

Flora Medal.

To Messrs. Daniels, Norwich, for an exhibit of Daffodils.

Banksian Medal.

To the Bronwylfa Bulb and Fruit Farm, Abergele, for an exhibit of Daffodils.

To Mr. C. T. Felton, Blackgreen, St. Albans, for an exhibit of Daffodils.

To Messrs. Kelway, Langport, for an exhibit of Daffodils.

To Mr. Peter Lower, Harpenden, for an exhibit of Daffodils.

Award of Merit.

To *Narcissus* 'Balmoral' as a variety for exhibition (votes 12 for, 4 against). Raised by The Brodie of Brodie and shown by Mr. J. L. Richardson. See p. 293.

To *Narcissus* 'Cardigan' as a variety for exhibition (votes unanimous). Raised by Mr. A. M. Wilson and shown by Mr. J. L. Richardson. See p. 293.

To *Narcissus* 'Cromarty' as a variety for exhibition (votes unanimous). Raised by The Brodie of Brodie and shown by Mr. J. L. Richardson. See p. 293.

To *Narcissus* 'Dunlewey' as a variety for exhibition (votes unanimous). Raised and shown by Mr. Guy L. Wilson. See p. 294.

To *Narcissus* ' Hawera ' as a variety for the alpine-house (votes unanimous). Raised in New Zealand by Mr. W. W. M. Thompson and shown by the Director, R.H.S. Gardens, Wisley. See p. 294.

To *Narcissus* ' Larne ' as a variety for exhibition (votes unanimous). Raised and shown by Mr. Guy L. Wilson. See p. 294.

To *Narcissus* ' Rathkenny ' as a variety for exhibition (votes unanimous). Raised and shown by Mr. Guy L. Wilson. See p. 294.

To *Narcissus* ' Silver Wedding ' as a variety for exhibition (votes unanimous). Raised and shown by Mr. Guy L. Wilson. See p. 294.

To *Narcissus* ' Sincerity ' as a variety for exhibition (votes unanimous). Raised by the late Dr. N. Y. Lower and shown by Mr. Guy L. Wilson. See p. 294.

Daffodil selected for Trial :—

Narcissus ' Gulliver,' shown by Messrs. Farrow, Holbeach St. Marks, Lincs., was selected for trial at Kirton as a variety for garden decoration, and for cutting from the open for market, and for trial at Wisley as a variety for garden decoration.

Daffodil to be seen again :—

The Committee expressed a desire to see again at a future meeting a hybrid *Narcissus triandrus concolor* and *N. Jonquilla,* shown by Mr. A. Gray, Penpol, Devoran, Truro.

Other Exhibits.

Mr. J. E. Exley, Wood Lane, Calverley, Leeds : *Narcissi* ' King Robert,' ' Perigo ' and ' King's Counsel.'

Messrs. H. Prins, Wisbech : *Narcissi* ' Moralis ' and ' Mary Lefeber.'

Mr. Guy L. Wilson : *Narcissus* ' Garron.'

C. F. Coleman, Esq., Broomhill, Hartley, Cranbrook, Kent : *Narcissus Pseudo-Narcissus.*

APRIL 20, 1938.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE (British Carnation Society's Spring Show).—Mr. GEO. MONRO in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To Carnations ' Peter Fisher ' for market (votes unanimous), ' Mellow Pink,' syn. ' Eleanor,' for exhibition and market (votes unanimous), ' Marchioness of Headfort ' for exhibition (votes unanimous), all shown by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath. See p. 291.

To Carnation ' Eva ' for market (votes unanimous), shown by The Farnham Royal Nurseries, Slough. See p. 291.

Other Exhibit.

Messrs. Allwood Bros., Haywards Heath : Carnation ' Allwood's Primrose.'

APRIL 26–28, 1938.

Competition in connexion with the exhibition of Flowering Trees and Shrubs.

Class A. 8 varieties of trees and/or shrubs.

First Prize, Silver Trophy : Sir Henry Price, Ardingly. (Gr. Mr. J. S. Coates.)

Second Prize, £2 : Lionel de Rothschild, Esq., Exbury. (Grs. Mr. F. Hanger and Mr. R. Findlay.)

Third Prize, £1 : Collingwood Ingram, Esq., Benenden.

Class B. 4 varieties of trees and/or shrubs.

First Prize, £3 : G. H. Johnstone, Esq., Grampound Road, Cornwall.

Second Prize, £1 10s. : Mrs. Sebag-Montifiore, Plymouth. (Gr. Mr. J. P. Izzard.)

Third Prize, 15s. : Mrs. C. M. Whittall, Haslemere. (Gr. Mr. J. M. Grant.)

Class C. 1 Tree or shrub.

First Prize, £1 : Mrs. C. M. Whittall, Haslemere. (Gr. Mr. J. M. Grant.)

Second Prize, 15s. : Major F. C. Stern, Goring. (Gr. Mr. J. Buckman.)

Class D. A species of tree or shrub, not introduced before 1920.

First Prize, £1 : Sir Henry Price, Ardingly. (Gr. Mr. J. S. Coates.)

Second Prize, 15s. : Major F. C. Stern, Goring. (Gr. Mr. J. Buckman.)

Third Prize, 10s. : Mrs. C. M. Whittall, Haslemere. (Gr. Mr. J. Grant.)

APRIL 26, 1938.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and four other members present.

A Proliferous variety of *Muscari armeniacum* '*Heavenly Blue*' was shown in flower. The branches from the main inflorescence stalk carried clusters of flowers in which some were perfect and others imperfectly developed. In certain features this sport resembled the Feather Hyacinth, which arose from *M. comosum*. It was sent by E. M. Blackburn, Esq., Fairway Cottage, Henley-on-Thames. (See JOURNAL R.H.S. **62**, cv.)

Unusual Daffodil.—Mr. Leak exhibited flowers of an unusual Daffodil, an Incomparabilis variety. It showed a perfect style. The corona was proliferated and joined to the stamens which were frequently abnormally foliose. Several stamens bore pollen. In certain respects the flowers showed similarity with the Double Roman Daffodil.

Primula Cawdoriana.—The plant submitted by Walker Bentley, Esq., Quarry Wood, Burghclere, Newbury, was identified as *P. Cawdoriana* (Notes, Edinburgh Botanical Gardens, Vol. 15, p. 87). The scape was glabrous, whilst that of *P. Buryana* to which this plant approximates is very hairy.

Seedling Grape Fruit.—E. A. Taylor, Esq., The Mount, Westerham, Kent, submitted a Seedling Grape Fruit grown on the Lemon as stock. The flavour and thickness of the outer covering of the fruit did not constitute any improvement on commercial varieties.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Exhibits.

H. Barnett, Esq., Westwood House, Tilehurst, Berks: Apple 'D'Arcy Spice.'

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Lawfam,' 'Ontario,' 'Stonetosh.'

E. A. Taylor, Esq., The Mount, Westerham, Kent: Seedling Grape Fruit.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Peed, West Norwood, for Streptocarpus.

Silver Flora Medal.

To Messrs. Dobbie, Edinburgh, for Calceolarias.

To Messrs. Engelmann, Saffron Walden, for Carnations, Pansies and Gerberas.

Silver Banksian Medal.

To Mr. F. J. Bell, Whitley Bay, for Violas.

To Messrs. B. R. Cant, Colchester, for Roses.

To Mr. J. Douglas, Great Bookham, for Auriculas.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Mr. G. H. Dalrymple, Bartley, for Auriculas.

Banksian Medal.

To Mr. H. A. Brown, South Chingford, for Fuchsias.

To Mrs. Bucknall, Doneraile, for Anemones.

To Mr. G. H. Dalrymple, Bartley, for hardy Primulas.

To Mr. T. Everitt, Enfield Lock, for Hydrangeas and Hippeastrums.

To Mr. D. R. Moore, Farnborough, for Pelargoniums.

To Messrs. Wall, Bath, for Aquilegias.

Award of Merit.

To *Hydrangea* 'Hatfield Rose' for market and as a pot plant (votes 13 for, 1 against), from Messrs. S. Low, Enfield. See p. 292.

Cultural Commendation.

To Messrs. Engelmann, Saffron Walden, for American greenhouse varieties of Antirrhinums. These produce magnificent spikes 6 feet tall. Most of the colours commonly found in the bedding varieties are represented in this strain.

Selected for trial at Wisley.

Primula 'White Wells' from Messrs. Mackenzie, Ilkley.

Primroses 16, 73, 73A, D.P., from P. Murray Thomson, Esq., Kingennie, Angus.

Polyanthus 44, 60, 65, 75, from P. Murray Thomson, Esq., Kingennie, Angus.

Other Exhibits.

Messrs. Clark, Dover : hardy plants.
T. B. Hart, Esq., Beaconsfield : Polyanthus.
C. J. Howlett, Esq., Earley : Polyanthus.
Mrs. H. Long, Swinford : Primroses.
Mrs. C. M. R. Louch, Keston : Viola 'Seagull.'
Mr. W. Yandell, Maidenhead : Violas.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Gold Medal.

To Colonel Stephenson R. Clarke, C.B., Haywards Heath, for flowering shrubs.
To Messrs. Hillier, Winchester, for flowering trees and shrubs.
To Messrs. Waterer, Bagshot, for flowering trees and shrubs.

Silver-gilt Flora Medal.

To Messrs. Cheal, Crawley, for flowering trees and shrubs.
To the Donard Nursery Co., Newcastle, Co. Down, for flowering shrubs.
To Messrs. Notcutt, Woodbridge, for flowering trees and shrubs.
To L. de Rothschild, Esq., Exbury, for flowering shrubs.

Silver-gilt Banksian Medal.

To Messrs. Stuart Low, Enfield, for flowering shrubs.
To Mr. W. J. Marchant, Wimborne, for flowering trees and shrubs.
To Messrs. Russell, Windlesham, for flowering trees and shrubs.

Silver Flora Medal.

To Hocker Edge Gardens, Cranbrook, for rock garden and bulbous plants.
To Mr. E. Ladhams, Elstead, for rock garden plants.

Flora Medal.

To Brookside Nurseries, Oxford, for rock garden plants.
To Messrs. Burkwood & Skipwith, Kingston, for flowering shrubs.
To Messrs. Constable, Southborough, for Lilies.
To Messrs. Prichard, Christchurch, for rock garden plants.
To Messrs. Rogers, Southampton, for rock garden plants.
To Messrs. Scott, Merriott, for flowering shrubs.
To Messrs. Waterer, Twyford, for rock garden plants.

Banksian Medal.

To Abercorn Nurseries, Chelmsford, for rock garden plants.
To Chez Nous Nurseries, Newick, for rock garden plants.
To Messrs. Feilden & Crouch, Wrotham, for rock garden plants.
To Messrs. Kelway, Langport, for Tree Paeonies.
To Marsden Nurseries, Ashtead, for rock garden plants.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. Neale, Worthing, for succulents.
To R. Newman, Esq., Dartmouth, for flowering shrubs.
To Messrs. Southgate, New Malden, for succulents.
To Mr. G. Welch, Cambridge, for rock garden plants.

Award of Merit.

To *Clianthus puniceus* as a flowering shrub for the cold house (votes unanimous), from Mr. W. J. Marchant, Wimborne. See p. 291.

To *Erica ventricosa* var. *superba* as a flowering shrub for the cool house (votes unanimous), from Lionel de Rothschild, Esq., Exbury. See p. 292.

To *Olearia Gunniana splendens* 'Downton' as a half-hardy flowering shrub (votes 10 for), from Mrs. H. W. Hall, Lymington. See p. 295.

Other Exhibits.

Mrs. Hiatt Baker, Almondsbury : forms of *Ranunculus asiaticus*.
E. M. Blackburn, Esq., Henley-on-Thames : proliferous form of *Muscari armeniacum*.
The Director, Cambridge Botanic Garden : *Cytisus proliferus*.
C. H. Curtis, Esq., Brentford : *Sansevieria Laurentii*.
Mrs. A. Desborough, Broadstone : *Staphylea holocarpa, Sophora tetraptera*.
Sir Thos. Hohler, Fawkham Manor, Kent : *Sophora microphylla*.
Mrs. Hopkinson, Coulsdon : rock garden plants.
Messrs. Jackman, Woking : *Ceanothus* 'Cascade.'
Mr. L. Lawrence, Taplow : succulents.
Messrs. Redgrove & Patrick, Sevenoaks : rock garden plants.
Mr. J. Robinson, Eltham : rock garden plants.
L. de Rothschild, Esq., Exbury : *Malus Toringo*.
Messrs. Russell, Windlesham : *Bougainvillaea* 'Orange King' (= 'Mrs. Louis Wathen'), *Elaeocarpus cyaneus*.

Major F. C. Stern, Goring-by-Sea : *Berberis calliantha* (**A.M.** 1932) ; *Chrysanthemum Catananche* (**A.M.** 1937).

Mr. R. Colpoys Wood, West Drayton : flowering shrubs.

Judge Woodcock, K.C., Hampstead : *Laburnum vulgare* var. *involutum*.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and twelve other members present.

Awards Recommended :—

Award of Merit.

To *Cymbidium* × 'Dorchester' var. 'Vera Salmon' (*Alexanderi* × 'Tityus') (votes 8 for), from R. J. Salmon, Esq., Houndsden Road, Winchmore Hill, N. 21. See p. 292.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group of Orchids.

Messrs. Armstrong & Brown, Tunbridge Wells : a group of Orchids.

Messrs. Stuart Low, Jarvis Brook : a group of Orchids.

J. V. Rank, Esq., Godstone, Surrey : *Renanthera Imschootiana*.

N. M. Jensen, Esq., Roehampton, S.W. 15 : *Cypripedium* × 'John Donovan.'

There were no entries for the Odontoglossum Trophy offered on this occasion.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Tulips.

Silver-gilt Banksian Medal.

To Messrs. Barr, 12 King Street, Covent Garden, for an exhibit of Tulips.

To Mr. Guy L. Wilson, Broughshane, Co. Antrim, for an exhibit of Daffodils.

Silver Banksian Medal.

To Messrs. Kelway, Langport, for an exhibit of Tulips.

Banksian Medal.

To Messrs. Daniels, Norwich, for an exhibit of Tulips and Daffodils.

To Messrs. D. Stewart, Ferndown Nurseries, Wimborne, for an exhibit of Tulips.

Award of Merit.

To *Narcissus* 'Dreamlight' as a variety for exhibition (votes 8 for). Raised and shown by Mr. Guy L. Wilson. See p. 293.

Daffodil to be seen again :—

The Committee expressed a desire to see again at a future meeting *Narcissus* 'Cantabile,' shown by Mr. Guy L. Wilson.

Other Exhibits.

Mr. Guy L. Wilson : *Narcissus* 'Armoy' and *N.* 'Cushendall.'

Mr. Copeland : an unnamed Leedsii variety, with reflexing perianth segments and a small, pale yellow corona, resembling to some extent a hybrid of *N. triandrus*, but containing no blood of that species.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and thirteen other members present.

Exhibit.

Lionel de Rothschild, Esq., Exbury, Southampton : *Rhododendron vernicosum*.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE.—Mr. GEORGE MONRO, C.B.E., in the Chair, and eight other members present.

Exhibits.

Carnation 'Nora Urling Clark' (to be seen again), shown by H. L. Urling Clark, Esq., Laglands, Reigate, Surrey.

Carnation sports of 'Betty Lou,' shown by Messrs. Holger Helbrink, Bronshej, Copenhagen, Denmark.

JOINT IRIS COMMITTEE.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and five other members present.

Selected for trial at Wisley.

Iris setosa form, shown by Mrs. Hiatt Baker, Oaklands, Almondsbury, nr. Bristol.

Other Exhibits.

Lord Digby, Minterne, Dorset : *Iris kumaonensis*.

F. Wynn Hellings, Esq., Grove Way, Esher : Iris 'Tony.'

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, M.C., O.B.E., F.L.S., in the Chair, and nine other members present.

Awards Recommended :—

Award of Merit.

To *Androsace Watkinsii* as a flowering plant for the rock garden (votes 7 for, 1 against), from Viscountess Byng of Vimy, Thorpe-le-Soken.

To *Daphne Cneorum eximia* as a flowering plant for the rock garden (votes unanimous), from A. T. Johnson, Esq., Conway.

To *Primula Sieboldii alba* as a flowering plant for the rock garden (votes 7 for, 1 against), from Messrs. F. G. Mackenzie, Ilkley.

Other Exhibits.

Mrs. G. Anley, Woking: *Geranium erianthum* var. *Onoei, Nandina domestica laciniata nana, N. domestica laciniata nana purpurea.*

W. Bentley, Esq., Newbury: *Cupressus macrocarpa* var. *pygmaea, Primula Cawdoriana.*

Viscountess Byng of Vimy, Thorpe-le-Soken: *Phlox* ' Silver Star.'

T. Hay, Esq., Hyde Park: *Viola papilionacea alba.*

Lady Lawrence, Dorking: *Aster trifidus.*

Messrs. M. Prichard, Christchurch: *Primula denticulata* ' Sylvia Watson.'

T. T. West, Esq., Merstham: *Cassiope fastigiata.*

G. White, Esq., Kingston Hill: *Campanula alpina, Ranunculus glacialis.*

DONATIONS TO THE SOCIETY'S GARDENS AT WISLEY, 1937.

(*Continued from p.* lxiv.)

SHERRARD, J. O., Oakham; seedlings of 'Rose Lily' from New Zealand. SIMONDS, Mrs. B., Winchester; plants of *Zauschneria latifolia*. SKINNER, F. L., Dropmore, Manitoba; seeds of *Asclepias verticillata*. SLOCOCK, Messrs. W. C., Ltd., Woking; collection of Rhododendrons (hybrids and species), Maples, Magnolias and other trees and shrubs for Battleston Hill. SMALL, E. P., Cheddar, Somerset; plants of seedling Strawberry. SMILEY, Lady, Wentworth, Virginia Water; plants of *Eupatorium micranthum* and *Myrtus Ugni*. SMITH, Dr. H. R., Capel, Surrey; bulbs or corms of *Crocus*, *Cyclamen* and *Tulipa* species for rock garden. SMITH, Mrs. LINDSAY, Chilworth, Surrey; plant of *Rhododendron* 'Otto Foster.' SMYTHE, F. S. (per Royal Botanic Garden, Edinburgh); collection of plants and seeds from Himalayan expedition. SOPPER, Lt.-Col. F. W., Gorthleck, Inverness; seeds of *Meconopsis*, *Primula* and *Trollius* species. SOUILLET, l'Abbé, Milly-par-Gennes, France; bulbils of *Lilium myriophyllum*. SPEIR, Col., Berwick; seeds of plants from Corsica. SPRINGETT, F. S., Hawkhurst, Kent; plant of *Dicranostigma*. STANIFORTH, G. W., Thetford; seeds of *Carica Papaya* and *Wormskioldia*. STEARN, W. T., R.H.S. Offices, Vincent Square, S.W. 1; seeds of *Aster anomalus*. STERN, F. C., Goring-by-Sea, Sussex; seeds of *Magnolia*, *Paeonia*, *Iris* species, etc. STEVENSON, J. B., Ascot; collections of Rhododendrons for Battleston Hill; cuttings of *Zieria Smithii*. STOUGHTON, Prof. R. H., Reading; collection of plants of herbs. STRASBOURG BOTANIC GARDEN, France; collection of seeds, chiefly of herbs. STREETER, F., Petworth Park Gardens, Sussex; grafts of Apples 'Duck's Bill' and 'Sussex Pippin'; plants of Heliotrope. SUTHERLAND, Dr., Portland Place, W. 1; seeds of *Carica Papaya*. SUTTON & SONS, Messrs., Reading; collection of seeds of annual plants. TAIHOKU IMPERIAL UNIVERSITY BOTANIC GARDEN, Formosa; seeds of uncommon trees and shrubs. TALBOT, Mrs. H., Barton Stacey, Winchester; plants of *Aquilegia viridiflora*; seeds of Orchids, etc., from Tanganyika. TASCHKENT UNIVERSITY BOTANIC GARDEN, U.S.S.R.; collection of seeds. THOMAS, G .W., Hea Moor, near Penzance; seeds of *Lilium taliense*; bulbs of *L. ochraceum*; plant of *Rhododendron Taggianum*. THOMPSON, Mrs. H. P., Weybridge; collection of seeds for rock garden. THOROLD, J. G., Dawlish, Devonshire; seeds of *Bignonia gracilis*. TODD, Lt.-Col. G. E., Mundham, Norfolk; plants of Raspberry 'Todd's Cardinal.' TORKINGTON, Mrs., Maidenhead; plants of *Saxifraga florulenta*. TRACEY, Mrs., Wimborne, Dorset; plants of *Senecio Tabacon*. TROTTER, R. D., Ockley, Surrey; collections of various plants, including *Daphne Mezereum alba* and bulbs of *Oxalis*, *Babiana*, etc.; seeds of *Codonopsis*, *Daphne* and *Paeonia*. TUBERGEN, C. G. VAN, Ltd., Haarlem, Holland; bulbs of *Scilla Tubergeniana*. TULLERTON, Mrs., Elstead, Godalming; plants of *Lilium* and *Cyclamen*. TUNNARD, H. B., St. Stephen's Club, Westminster; plants of *Corydalis cashmeriana*; seeds of *Caesalpinia* and *Phaenocoma*. VARIAN, W., Kyverdale Road, N. 16; seeds of Mandarin Hollyhocks and white Jasmine. VILMORIN-ANDRIEUX ET CIE, Messrs., Verrières-le-Buisson, France; collection of seeds of shrubs. VLEUTEN, D. B. VAN, Leur, N.B., Holland; buds of Apples 'Lützel Sachser,' 'Ruth Gerstetter' and 'Zigeunerin.' VŒUX, Col. H. DES, Newbury, Berks; seeds of *Meconopsis napaulensis*. WAGENINGEN ARBORETUM, Holland; collection of tree and shrub seeds. WALL, J. T., Wisley; seeds of *Solanum* species with large red fruit. WALLACE, Messrs. R., & Co., Ltd., Tunbridge Wells; bulbs of *Lilium Maximowiczii*. WARBURG, Sir O. (the late), Headley, near Epsom; collection of *Quercus* species and other plants. WASHINGTON, UNIVERSITY ARBORETUM OF, Seattle, U.S.A.; seeds of *Nothofagus*, *Picea* and *Sambucus* species. WATERER, SONS & CRISP, Messrs., Bagshot; plants of *Davidia*, *Berberis*, *Ceanothus*, *Diospyros*, *Rhus* and *Viburnum*. WATERFIELD, Miss B. A., Anerley, S.E. 20; collection of seeds from Peru. WATKINS & SIMPSON, Messrs., Drury Lane, W.C. 2; collection of seeds of annual plants; of twelve varieties of Wallflowers; plants of Bush Strawberry. WATSON, J. H., Withington, Manchester; bulbs of *Lilium* species. WATSON, Miss, Woking; seeds of *Leonotis Leonurus*. WATT, J. C., Aberdeen; seeds of Tibetan species of *Gentiana*, *Meconopsis*, *Primula*, etc.; cuttings of Camellias and hybrid *Rhododendron*. WATTS, R. A., North Petherton, Somerset; cuttings of form of *Veronica speciosa*. WEEKS, A. G., Limpsfield, Surrey; plants of *Anacyclus*,

Rhododendron obtusum 'Hinodegiri,' *R. radicans*, etc. WELLS, JNR., Messrs., Merstham, Surrey; plant of *Primula scapigera*. WICKHAM, Mrs. E. T. R., Bishop's Lydeard, Somerset; bulbs of *Amaryllis Belladonna*. WIEGAND, K. M., Cornell University, Ithaca, N.Y.; seeds of four species of *Arnica*. WILKIN, H. T., c/o Messrs. Carters Tested Seeds, Ltd.; quantity of seeds of new hybrid Polyanthus. WILLETT, Major K., South Cadbury House, near Yeovil; grafts of Apple 'Camelot.' WILLIAMS, C. T., Abbot's Leigh, Bristol; grafts of *Prunus yedoensis* var. *perpendens*; cuttings of *Ceanothus velutinus*, *Phlomis fruticosa* var.; seeds of *Kniphofia nobilis*; plant of hybrid *Berberis*. WILLIAMS, Dr. A. H., Roffey, Horsham; seeds of *Notospartium Carmichaeliae*, *Senecio*, *Hoheria sexstylosa*, etc.; cuttings of *Olearia* species, *Senecio*, and other shrubs. WILLIAMS, J. E., Llandaff, Cardiff; seeds of *Magnolia sinensis* and *Anemonopsis macrophylla*. WILSON, E. K., Wimbledon Common, S.W. 19; seeds of *Dianthus* sp.; collection of *Rhododendron* plants for Battleston Hill. WORMALD, H., East Dereham, Norfolk; tuber of *Tropaeolum tricolor*. WYATT, J. W., Cavendish Square, W. 1; collections of seeds from Tasmania and New Zealand. WYLIE, Col., Hindhead; collection of seeds from Bangalore.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS.

MAY 3, 1938.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON in the Chair, and nineteen other members present.

Awards Recommended:—

First-class Certificate.

To *Rhododendron* × 'Dorinthia' (votes 16 for), from Lord Aberconway, Bodnant, N. Wales. See p. 337.

Award of Merit.

To *R.* × 'Kewdec' var. 'White Lady' (votes 13 for, 3 against), from Admiral Walker-Heneage-Vivian, Clyne Castle, Blackpill, Swansea. See p. 337.

To *R.* × 'Naomi' var. 'Nautilus' (votes 15 for), from Lionel de Rothschild, Esq., Exbury, Southampton. See p. 337.

To *R.* × 'Phidias' (votes 17 for), from Lord Aberconway. See p. 337.

Other Exhibits.

Capt. A. M. Talbot Fletcher, Margam Castle, Port Talbot, Glamorganshire: Two Rhododendron hybrids (*R. decorum* × *R. Fortunei*; and *R.* × *Gauntlettii* × *R. Thomsonii*).

Harold Heal, Esq., Netherfield, Battle, Sussex: *R.* × *Loderi* var. 'Netherfield Rose' (*R. Loderi* 'Sir Edmund' × *R. Loderi* 'Snowdrop').

Collingwood Ingram, Esq., Benenden, Kent: *R.* × 'Retrich' (*R. reticulatum* × *R. Weyrichii*).

Edward G. Vandevere, Esq., 490 Post Street, San Francisco, U.S.A.: An Azaleodendron hybrid, produced by crossing *R. Griersonianum* with *R. occidentale*.

Admiral Walker-Heneage-Vivian: *R.* × 'Coronation' (*R.* × 'Ernest Gill' (*R. arboreum* × *R. Fortunei*) × *R.* × *hewense*).

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and ten other members present.

Awards Recommended:—

Award of Merit.

To *Boykinia Jamesii* as a flowering plant for the rock garden or alpine house (votes 7 for, 3 against), from Dr. P. L. Giuseppi, Felixstowe, Miss D. C. Hopton, Bartestree, and Mrs. Dyson Perrins, Davenham, Malvern. See p. 334.

To *Lewisia brachycalyx* as a flowering plant for the alpine house (votes 8 for), from Mrs. W. D. Crewdson, Kendal, and Mrs. A. N. Griffith, Newnham, Cambridge. See p. 335.

To *Menziesia ciliicalyx* as a flowering plant for the rock garden and alpine house (votes 7 for), from R. B. Cooke, Esq., Corbridge, Northumberland. See p. 336.

To *Primula hyacinthina* as a flowering plant for the rock garden or alpine house (votes 7 for, 1 against), from R. B. Cooke, Esq. See p. 336.

To *Ranunculus graminifolius* as a flowering plant for the rock garden (votes unanimous), from Mrs. Winterbotham, Beaconsfield. See p. 337.

To *Viola aetolica saxatilis* as a flowering plant for the rock garden (votes 8 for), from G. P. Baker, Esq., Sevenoaks. See p. 338.

Preliminary Commendation.

To *Centaurea rupicola* as a flowering plant for the alpine house (votes 8 for), from Dr. P. L. Giuseppi.

To *Erigeron simplex* as a flowering plant for the rock garden or alpine house (votes unanimous), from Mrs. C. B. Saunders, Green Street Green, Kent.

To *Meconopsis discigera* as a flowering plant for the rock garden (votes 10 for), from Mrs. Crewdson.

To *Polygala anatolica* as a flowering plant for the rock garden (votes 6 for), from Miss E. A. Britton, Tiverton.

To *Viola pedata bicolor alba* as a flowering plant for the rock garden or alpine house (votes unanimous), from W. Bentley, Esq., Burghclere, Hants.

Cultural Commendation.

To Dr. R. Bevan, Henley-on-Thames, for *Erinacea pungens* (**A.M.** 1932).

To Miss E. M. Savory, Olney, Bucks, for *Asplenium septentrionale.*

Other Exhibits.

Messrs. Allwood Bros., Haywards Heath : *Dianthus* ' Ruby.'

Alpine Nurseries Ltd., West Moors : *Genista delphinensis.*

Mrs. G. Anley, Woking : *Artemisia pedemontana.*

G. P. Baker, Esq., Sevenoaks : *Fritillaria pontica, F. Meleagris alba, Lewisia Howellii minor, Narcissus Bulbocodium* form, *Sedum fastigiatum.*

W. Bentley, Esq., Burghclere : *Cupressus macrocarpa pygmaea, Leiophyllum buxifolium prostratum.*

G. H. Berry, Esq., Enfield : *Silene* ' Sunrise.'

Dr. R. Bevan : *Calceolaria Fothergillii, Linaria Tournefortii.*

Mr. S. Boothman, Maidenhead : *Sarcocapnos enneaphylla.*

Miss E. A. Britton, Tiverton : *Chrysanthemum Catananche, Libertia sp.*

Messrs. A. Charlton, Tunbridge Wells : *Daphne* × *Burkwoodii* var.

Mrs. Crewdson, Kendal : *Primula szechuanica K.W.* 11,615.

P. A. Ferns, Esq., Wilmslow : *Erinacea pungens.*

Mrs. Garnett-Botfield, Albrighton, Wolverhampton : *Rhodohypoxis Baurii major, R. Baurii* ' Margaret Rose.'

Dr. P. L. Giuseppi, Felixstowe : *Celmisia Sinclairi, Helonias bullata, Narcissus juncifolius major, Oreocharis primuloides alba, Sedum Chaneti, Sempervivum octopodes, Scutellaria indica japonica, Veronica Bonarota.*

Mrs. A. N. Griffith, Newnham, Cambridge : *Berberis stenophylla gracilis, Daphne Giraldii, Lewisia rosea, Narcissus juncifolius.*

Miss M. Hincks, Winsford, Somerset : *Mertensia sp.*

Miss D. C. Hopton, Bartestree, Hereford : *Eritrichium strictum, Globularia cordifolia rosea, Chrysanthemum Mawi, Viola Cunninghamii.*

Messrs. W. E. Th. Ingwersen, E. Grinstead : *Ramondia Nathaliae rosea fimbriata.*

Mrs. R. S. Milford, Chedworth, Glos. : *Cyrtanthus lutescens* (**A.M.** 1936), *Helichrysum fulgidum* (H.M. 628), *Scilla sp.*

Dr. H. Roger-Smith, Capel, Surrey : *Primula longiflora.*

Miss E. M. Savory, Olney, Bucks : *Rhamnus pumila.*

Mrs. Winterbotham, Beaconsfield : *Campanula rupestris* (**A.M.** 1904), *Helichrysum fulgidum, Viola septentrionale.*

MAY 10, 1938.

SEWELL MEDAL COMPETITION.

Amateurs Medal.

To Mark Fenwick, Esq., Abbotswood, Stow-on-the-Wold (gr. W. Tustin).

Horticultural Traders Medal.

To Hocker Edge Gardens, Cranbrook.

A lecture was given by Mr. H. STEVENS on " Flower Decoration." Chairman, Mr. GEORGE MONRO, C.B.E., V.M.H.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and six other members present.

Primula tibetica.—A dwarf form with both scape and pedicels shorter than normal was sent by Lord Aberconway, Bodnant. It agreed in all other characters with *Primula tibetica.*

Tulip.—Dr. Barnes reported that the curious Tulip he had shown in May 1936 had this year reverted to the parrot form. (See JOURNAL R.H.S., **61**, p. CXX.)

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and eleven other members present.

Exhibit.

R.H.S. Commercial Fruit Trials, Wisley: Apples 'Ascot' and 'Woolbrook Russet.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

Silver Banksian Medal.

To Mr. F. J. Bell, Whitley Bay, for Violas and Pansies.
To Messrs. F. Cant, Colchester, for Roses.
To Messrs. Peed, West Norwood, for Gloxinias.

Flora Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations, Zinnias and Gerberas.

Banksian Medal.

To Messrs. Kelway, Langport, for Lupins, Delphiniums, Tulips and Paeonies.
To Messrs. S. Low, Enfield, for Carnations.
To Messrs. Napier, Taunton, for Carnations.
To Messrs. Stewart, Ferndown, for Scillas, Tulips and Shrubs.

Selected for trial at Wisley.

Schizanthus 'Cherry Shades' from Messrs. Carters Tested Seeds, Raynes Park.

Other Exhibits.

Messrs. Allwood, Haywards Heath: *Dianthus Allwoodii* 'James.'
Mr. E. J. Barker, Ipswich: Primula 'Velvet.'
Mr. T. Everitt, Enfield Lock: Hydrangeas and Hippeastrums.
Mrs. D. R. Moore, Farnborough: Pelargoniums.
Messrs. Prichard, Christchurch: *Paeonia* 'Pearl of May' (to be seen again).
Messrs. Simmons, Finchley: Violas.
Messrs. Toogood, Southampton: Stocks and Schizanthus.
Messrs. Wheatcroft, Nottingham: Roses.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Jackman, Woking, for Clematis.
To Messrs. Stuart Low, Enfield, for flowering shrubs.
To Messrs. Russell, Windlesham, for greenhouse foliage plants.

Silver Banksian Medal.

To Mr. E. Ladhams, Elstead, for rock garden plants.

Flora Medal.

To Messrs. Pennell, Lincoln, for Clematis and Statice.
To Messrs. Prichard, Christchurch, for rock garden plants.
To Messrs. Wood, Taplow, for rock garden plants.

Banksian Medal.

To Mr. J. Klinkert, Richmond, for clipped trees.
To Letchworth Plants, Ltd., Letchworth, for rock garden plants.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. Neale, Worthing, for succulents.
To Messrs. Rogers, Southampton, for rock garden plants.
To Messrs. Southgate, New Malden, for succulents.
To Messrs. Waterer, Twyford, for rock garden plants.

Award of Merit.

To *Clianthus puniceus* var. *albus* as a tender flowering plant (votes 11 for), from Lord Aberconway, Bodnant. See p. 334.

To *Olearia Gunniana* 'Exbury White' as a hardy flowering shrub (votes 10 for), from Lionel de Rothschild, Esq., Exbury. See p. 336.

To *Ourisia macrophylla* as a hardy flowering plant (votes 10 for), from Lione de Rothschild, Esq., Exbury. See p. 336.

Other Exhibits.

Abercorn Nurseries, Chelmsford: rock garden plants.
The Duke of Bedford, Woburn Abbey: *Berberis hakeoides*.
Col. Stephenson R. Clarke, Haywards Heath: *Primula sp.* Gould No. 10.
Messrs. Constable, Burnham: *Lilium umbellatum erectum*.
Mr. A. Corderoy, Eltham: rock garden plants.
Miss P. Dimsdale, Lechlade: *Paeonia emodi* × *P. Veitchii*.
Collingwood Ingram, Esq., Benenden: *Prunus Maximowiczii*.
L. de Rothschild, Esq., Exbury: *Olearia Gunniana* 'Exbury Blue.'
Messrs. Russell, Windlesham: *Begonia semperflorens*, variegated form.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and ten other members present.

Award Recommended:—

Award of Merit.

To *Cymbidium* × 'Lucinda,' Cannizaro var. ('Redshank' × 'Flamingo'), (votes unanimous), from E. Kenneth Wilson, Esq., Cannizaro, Wimbledon, S.W. See p. 335.

There were no other exhibits on this occasion.

NARCISSUS AND TULIP COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

Awards Recommended:—

Gold Medal.

To Messrs. Dobbie, Edinburgh, for an exhibit of Tulips.

Silver-gilt Flora Medal.

To Messrs. Barr, 12 King Street, Covent Garden, W.C. 2, for an exhibit of Tulips.

Silver-gilt Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for an exhibit of Tulips.

Silver Flora Medal.

To Messrs. Heemskerk, Hillegom, Holland, for an exhibit of Tulips.

Silver Banksian Medal.

To Messrs. Daniels, Norwich, for an exhibit of Tulips.

To Canon Rollo Meyer, Manor End, Little Gaddesden, Berkhamsted, for an exhibit of Tulips.

To Messrs. Wakeley Bros., Bankside, S.E. 1, for an exhibit of Tulips.

Banksian Medal.

To Messrs. H. Prins, Wisbech, for an exhibit of Tulips.

Other Exhibits.

Messrs. Barr: Tulips 'Gerontius' and 'Red Douglas.'

An unnamed bicolor Daffodil, in which the corona was more than one-third, but less than equal to, the length of the perianth segments, and in which the stamens and corona were becoming petaloid, was submitted by Lord Darnley for classification. It was decided that the variety belonged to Division 10.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON in the Chair, and eleven other members present.

Exhibits.

E. J. P. Magor, Esq., St. Tudy, Bodmin, Cornwall: *Rhododendron* × Auredge' (*R. aureum* × *R. Edgeworthii*).

Sir John Ramsden, Bt., Bulstrode, Gerrards Cross, Bucks: *R.* × 'Griersims' (*R.* × 'G. A. Sims' × *R. Griersonianum*), and *R.* × 'Pinkie' (*R. Griersonianum* × *R.* × 'Lady G. Broderick').

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and six other members present.

Exhibits.

Lord Aberconway, Bodnant: *Primula sikkimensis subpinnatifida*, *P. tibetica* (dwarf form).

G. P. Baker, Esq., Sevenoaks: *Primula Rockii* (**A.M.** 1935).

E. J. Barker, Esq., Ipswich: Aubrietia 'Double Stock-Flowered Pink,' Aubrietia 'Double Stock-Flowered Rose.'

JOINT IRIS COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and six other members present.

Exhibits.

Svend G. Fiedler, Esq., Rosehill, Claygate, Surrey: *Iris susiana* (**A.M.** 1935).
F. Wynn Hellings, Esq., Grove Way, Esher, Surrey: *Iris* 'Eleanor Roosevelt.'

MAY 24, 1938.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and twenty-six other members present.

Selected for trial at Wisley.

Melon 'Coronation,' from Mr. N. S. Holland, Saxby's, Cowden, Kent.
Strawberry 'Redbourn,' from Mr. G. Stanley Dunn, The Hame, Redbourn, Herts.

Other Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Apple 'Orleans Reinette.'
Lady Leconfield, Petworth Park, Petworth: 'Newberry.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and twenty-three other members present.

Awards Recommended:—

Award of Merit.

To *Paeonia suffruticosa* 'Comtesse de Tudor' as a variety for exhibition and for the border (votes unanimous), from Major F. C. Stern, O.B.E., M.C., F.L.S., Goring-by-Sea.

Selected for trial at Wisley.

Calceolaria 'Rubin,' from Mr. C. Hansen, Copenhagen.
Dianthus Allwoodii 'Enid,' from Messrs. Allwood, Haywards Heath.
Lupinus polyphyllus 'Enchantress,' from Messrs. W. H. Simpson, Birmingham.
Papaver orientale 'Salmon Glow,' from Messrs. Hewitt, Stratford-on-Avon.
Papaver nudicaule 'Milford Art Shades,' from Mr. W. Spencer, Milford.

Other Exhibits.

Messrs. Allwood, Haywards Heath: *Dianthus Allwoodii alpinus* 'Apollo' and *D. Allwoodii alpinus* 'Ruby.'
A. E. Blake Amos, Esq., Colchester: Pelargonium 'A. E. Blake Amos.'
Messrs. A. A. Buckwell, St. Mary Cray: Hydrangea 'Alice.'
Sir Bunnell Burton, Ipswich: Salvia 'Mrs. Raymond Reade.'
Messrs. F. Cant, Colchester: Rose 'Dr. Frank Radcliffe.'
Mr. P. C. C. Crockford, Swindon: *Chrysanthemum maximum* seedling.
Mr. T. Robinson, Nottingham: Rose 'Orange Sensation.'
Messrs. W. H. Simpson, Birmingham: *Lupinus polyphyllus* 'Brilliant,' 'Favourite,' and 'Oxonian.'
R. G. Taylor, Esq., Woodley: Petunia 'Glenmore.'
Miss L. Wamsley, London: Pansies 'Picotee' and 'Super Strain,' Viola 'Blue Blaze.'
Messrs. Willik, Leicester: Rose 'Else's Rival' (to be seen again).

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty-eight other members present.

Awards Recommended:—

First-class Certificate.

To *Telopea truncata* as a hardy flowering shrub (votes 19 for, 2 against), from Lionel de Rothschild, Esq., Exbury, Southampton. See p. 338.

Award of Merit.

To *Arisaema sikokianum* as a hardy flowering plant (votes 16 for, 6 against), from Messrs. Perry, Enfield. See p. 334.

To *Canarina Eminii* as a flowering plant for the cool house (votes 17 for), from P. M. Synge, Esq., West Byfleet. See p. 334.

To *Fendlera rupicola* as a hardy flowering shrub (votes unanimous), from Dame Alice Godman, D.B.E., Horsham. See p. 335.

To *Homeria collina ochroleuca* as a tender flowering plant (votes 17 for), from T. T. Barnard, Esq., Wareham. See p. 335.

To *Scilla peruviana* as a hardy flowering plant (votes 20 for, 2 against), from F. C. Stern, Esq., Goring-by Sea. See p. 338.

To *Mahonia lomariifolia* as a hardy foliage shrub (votes unanimous), from Messrs. Charlton, Tunbridge Wells. See p. 335.

To *Symplocos paniculata* as a hardy flowering shrub (votes 24 for), from Dame Alice Godman, D.B.E., Horsham. See p. 338.

Preliminary Commendation.

To *Alstroemeria* 'Borde Hill Hybrid' as a hardy flowering plant (votes unanimous), from Colonel Stephenson R. Clarke, C.B., Haywards Heath.

Other Exhibits.

Lord Aberconway, Bodnant, N. Wales: *Philesia buxifolia* (**A.M.** 1937).
Mrs. A. E. Arthur, Pitsea: *Cereus flagelliformis.*
Baggesen's Nurseries, Pembury: *Cytisus* 'Ian Davison.'
G. P. Baker, Esq., Sevenoaks: *Paeonia sp.*
T. T. Barnard, Esq., Wareham: *Cistus populifolius, Leycesteria crocothyrsos.*
Messrs. J. Blaauw, Boskoop: *Berberis Thunbergii* seedling.
Dartington Hall, Ltd., Totnes: *Primula* 'Ann Jeffery.'
Col. Stephenson R. Clarke, C.B., Haywards Heath: *Primula Columnea microphylla.*
Capt. H. J. Dunne Cooke, London, W. 1: *Phyllocactus Ackermannii.*
Mrs. Debenham, Sherborne: *Primula* 'Glanvilles Hybrid.'
Messrs. Gibson, Leeming Bar: *Thuja* seedling.
Dame Alice Godman, D.B.E., Horsham: *Ceanothus velutinus.*
J. Gray, Esq., Saxmundham: *Armeria Welwitschii alba.*
Collingwood Ingram, Esq., Benenden: *Paeonia* 'Alice Harding,' *Salix Humboldtiana* fastigiate form, *Lavandula Stoechas* Riff Mts. form.
The Marchioness of Londonderry, Newtownards: *Hakea ulicina.*
W. R. Lysaght, Esq., C.B.E., Chepstow: *Ceanothus thyrsiflorus* Castleford variety, *Rosa gigantea.*
Nairn's Nurseries, Christchurch, N.Z.: *Malus* 'Spreydonia.'
R. Newman, Esq., Dartmouth: *Echium fastuosum, E. Wildprettii.*
Exors. of the late Mr. R. C. Notcutt, Woodbridge: *Lonicera chaetocarpa.*
Parley Brook Nurseries, Woking: *Cupressus pisifera* 'Gold Spangle.'
Messrs. Perry, Enfield: *Eriophorum latifolium, Ophiopogon Jaburan* var. *albifolia.*
A. W. Proudlock, Esq., Stafford: *Cytisus* seedling.
The Duke of Richmond and Gordon, Goodwood: *Richardia Rehmannii.*
Lord Rockley, Poole: *Amorphophallus mozambicensis.*
L. de Rothschild, Esq., Exbury: *Olearia floribunda.*
Exors. of the late Viscountess St. Cyres, Lymington: *Prostanthera rotundifolia.*
Lord Swaythling, Southampton: *Nomocharis aperta.*
P. M. Synge, Esq., West Byfleet: *Tillandsia* sp.
Mrs. J. E. Tomkinson, Twyford: *Cytisus* seedlings.
Messrs. Watson, Killiney: *Ceanothus floribundus.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bt., in the Chair, and twenty-three other members present.

Awards Recommended:—

Award of Merit.

To *Vanda tricolor* var. *planilabris* (votes 19 for), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey. See p. 338.

To *Bulbophyllum Lobbii*, Gatton Park var. (votes 15 for), from Sir Jeremiah Colman, Bt. See p. 334.

To *Laeliocattleya* × 'Kismet' var. 'The Spinney' (*C.* × 'Tityus' × *L.-c.* × 'General Maude') (votes 15 for, 7 against), from F. E. Griggs, Esq., The Spinney, Chislehurst, Kent. See p. 335.

To *Laeliocattleya* × 'Rome' var. 'Romulus' (*C.* × 'Remy Chollet' × *L.-c.* × 'James Goodier') (votes unanimous), from Messrs. Sanders, St. Albans. See p. 335.

To *Odontioda* × 'Pauline' var. 'Crimson King' (*Odontioda* × *Leeana* × *Odontoglossum* × 'Miguelito') (votes 14 for, 5 against), from Messrs. Stuart Low, Jarvis Brook, Sussex. See p. 336.

To *Odontoglossum* × 'Brito-Martis' var. *platycheilon* ('Britannia' × 'Purple Emperor') (votes 14 for, 4 against), from Messrs. Charlesworth, Haywards Heath. See p. 336.

To *Miltonia* × 'Limelight' var. 'Vesuvius' (*Armstrongii* × 'Lycaena') (votes unanimous), from Messrs. Armstrong & Brown, Tunbridge Wells. See p. 336.

To *Odontoglossum* × ' Brimstone Butterfly ' var. ' Golden Glow ' (*Armstrongii* × *crispum*) (votes 18 for), from Messrs. Armstrong & Brown. See p. 336.

To *Vuylstekeara* × ' Rosalie ' var. ' Sunset ' (*Odontioda* × ' Lorna ' × *Odontonia* × ' Duchess of York ') (votes 18 for), from Messrs. McBean, Cooksbridge, Sussex. See p. 338.

NARCISSUS AND TULIP COMMITTEE.—Mr. W. B. CRANFIELD, F.L.S., V.M.H., in the Chair, and eighteen other members present.

There were no plants for the Committee's inspection.

JOINT RHODODENDRON COMMITTEE.—Mr. E. H. WILDING in the Chair, and seventeen other members present.

Awards Recommended :—

Award of Merit.

To *Rhododendron chlorops* (F. 16463) (votes 11 for, 4 against), from the Earl of Stair, Lochinch Castle, Wigtownshire. See p. 337.

To *R.* × ' Fusilier ' (votes 10 for, 4 against), from Lionel de Rothschild, Esq., Exbury, Southampton. See p. 337.

Other Exhibits.

Lord Aberconway, Bodnant, N. Wales : *R.* × ' Sunrise ' (*R. Griersonianum* × *R. Griffithianum*). (To be seen again.)

Lieut.-Colonel E. H. W. Bolitho, Trengwainton, Heamoor, Cornwall : *R. Elliottii* (**F.C.C.** 1937).

G. H. Caton Haigh, Esq., Hafod Cae Maen, Penrhyndeudraeth, Merioneth : *R.* × ' Gwillt-king ' (*R. Griersonianum* × *R. zeylanicum*), and an unnamed hybrid, *R. campylocarpum* × *R. Griersonianum.*

Collingwood Ingram, Esq., Benenden, Kent : *Rhododendron rubropilosum.*

Lady Martineau, Kings Bourne, Wentworth, Virginia Water : *R. occidentale* 'Merced.'

Admiral Walker-Heneage-Vivian, Clyne Castle, Swansea : *R. megacalyx* (F. 20094) (**A.M.** 1937).

JOINT DELPHINIUM COMMITTEE.—The Hon. DAVID BOWES-LYON in the Chair, and ten other members present.

There were no exhibits before the Committee.

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Mr. D. INGAMELLS in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

Carnations ' Puritan,' as a market variety (votes unanimous), and ' Allwood's Cream,' as an exhibition variety (votes unanimous), both shown by Messrs. Allwood Bros., Wivelsfield Nurseries, Haywards Heath, Sussex. See p. 334.

Other Exhibits.

Messrs. Allwood : Carnations ' Allwood's Primrose,' ' Royal Salmon ' (to be seen again).

Messrs. Holger Helbrink, Copenhagen, Denmark : Carnation sports of ' Betty Lou ' (including ' Flesh Pink Betty Lou ').

JOINT IRIS COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and fourteen other members present.

Selected for Trial at Wisley.

Iris ' Hall Croft,' shown by H. Chadburn, Esq., Middleton-cum-Fordley, Saxmundham.

Iris ' Red Orchid,' shown by F. Wynn Hellings, Esq., Grove Way, Esher, Surrey.

Other Exhibits.

F. W. Tomalin, Esq., Gloucester Road, Hampton : Irises ' Golden Miller,' ' Silver Chalice,' ' Ann of Clive ' and ' Honeycomb.'

Mrs. E. J. Lloyd Edwards, Trevor Hall, Wrexham : Irises ' Trevor Hybrid and ' Pallida dalmatica hybrid.'

C. W. Christie-Miller, Esq., Henley-on-Thames : *Iris tectorum.*

F. Wynn Hellings, Esq., Grove Way, Esher : *Iris* ' Dark Butterfly.'

G. P. Baker, Esq., Hillside, Oakhill Road, Kippington, Sevenoaks, Kent: Irises ' Sylphide,' Seedlings Nos. 193/1931, 274, 281/1933, 52/1934, 448, 101, ' Violet Bonnet,' *I. Ewbankiana* (**A.M.** 1936) and *I. Douglasiana* seedling.

JOINT ROCK GARDEN PLANT COMMITTEE.—Major F. C. STERN, O.B.E., M.C., F.L.S., in the Chair, and twelve other members present.

Awards Recommended :—

Award of Merit.

To *Eritrichium nanum* as a flowering plant for the alpine house (votes 6 for), from Frank Barker, Esq., Stevenage, Herts. See p. 335.

Preliminary Commendation.

To *Libertia sp.* as a flowering plant for the alpine house (votes 7 for), from Miss E. A. Britton, Tiverton, N. Devon.

Cultural Commendation.

To Frank Barker, Esq., for a specimen of *Eritrichium nanum.*

To Mr. A. Perry, Enfield, for a specimen of the Japanese form of *Pinguicula vulgaris.*

Other Exhibits.

Mrs. G. Anley, Woking : *Silene* hybrid (*S. Hookeri* × *S. Ingramii*), *Veronica diosmaefolia* (**F.C.C.** 1873).

Frank Barker, Esq., Stevenage : *Campanula Allionii* ' Silver Bells.'

Dr. R. Bevan, Henley-on-Thames : *Linaria faucicolor* × *filicaulis.*

Mr. S. Boothman, Maidenhead : *Campanula petrophila.*

Viscountess Byng of Vimy, Thorpe-le-Soken : *Viola Howellii.*

Messrs. G. & A. Clark, Dover : *Veronica* ' Dover Pink.'

Dartington Hall, Ltd., Totnes : *Cheiranthus hybrida* ' Dorothy.'

T. Hay, Esq., Hyde Park : *Arenaria foliosa.*

Lady Lawrence, Dorking : *Aquilegia caerulea* (**F.C.C.** 1865).

Mr. R. V. Roger, Pickering : *Saxifraga* ' Cloth of Gold.'

CHELSEA SHOW.

MAY 25, 26 AND 27, 1938.

Held in the Grounds of the Royal Hospital, Chelsea.

LIST OF AWARDS.

The Sherwood Challenge Cup, for the most meritorious exhibit in the Show.

To Messrs. Blackmore & Langdon, Bath, for an exhibit of a mixed group of Begonias, Gloxinias and Delphiniums.

The Cain Challenge Cup, for the best exhibit shown by an amateur.

To J. Pierpont Morgan, Esq., LL.D., D.C.L., D.Sc., Wall Hall, Watford, Herts (gr. Mr. F. A. Steward), for an exhibit of stove and greenhouse plants.

Gold Medals.

To Messrs. Laxton, Bedford, for Strawberries.

To Messrs. Armstrong & Brown, Tunbridge Wells, for Orchids.

To Messrs. McBean, Cooksbridge, nr. Lewes, for Orchids.

To Messrs. Sanders, St. Albans, for Orchids.

To Mr. Percy S. Cane, Cliveden Place, S.W., for an informal garden.

To Knap Hill Nursery, Woking, for a children's garden.

To Messrs. R. Wallace, Tunbridge Wells, for an informal garden.

To Mr. A. Gavin Jones, Letchworth, for a rock garden.

To Mr. G. G. Whitelegg, Chislehurst, for a rock garden.

To Messrs. Wm. Wood, Taplow, for a rock garden.

To Messrs. Barr, King Street, W.C. 2, for Tulips.

To Messrs. Charlesworth, Haywards Heath, for Orchids.

To Mr. R. Hancock, Sloane Street, S.W., for a garden.

To Lord Aberconway, C.B.E., V.M.H., Bodnant, Tal-y-Cafn, N. Wales (gr. Mr. F. C. Puddle), for Streptocarpus and Hippeastrum Hybrids (Bodnant strains).

Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Blackmore & Langdon, Bath, for a mixed group of Begonias, Gloxinias and Delphiniums.

To Messrs. Robert Bolton, Halstead, for Sweet Peas.

To Messrs. Carters Tested Seeds, Raynes Park, for Florists' Flowers.

To Messrs. Alex. Dickson & Sons, Newtownards, for Roses.

To Messrs. C. Engelmann, Saffron Walden, for Carnations.

To Lionel de Rothschild, Esq., O.B.E., V.M.H., Exbury (grs. Mr. F. Hanger and Mr. R. Findlay), for Hippeastrum Hybrids raised by the Exhibitor.

To Messrs. Sutton, Reading, for Antirrhinums from seed.

To Messrs. W. A. Constable, Tunbridge Wells, for Lilies.

To J. Pierpont Morgan, Esq., LL.D., D.C.L., D.Sc., Watford (gr. Mr. F. A. Steward), for stove and greenhouse plants.

To Messrs. L. R. Russell, Windlesham, for stove and greenhouse plants.

To Messrs. R. Wallace, Tunbridge Wells, for a mixed group of Lilies, Rhododendrons, Azaleas and bulbous plants.

To Messrs. John Waterer, Sons & Crisp, Bagshot, for Rhododendrons.

To Messrs. Bees, Chester, for a mixed group of herbaceous plants and Lilies.

Silver Cups.

To Messrs. Black & Flory, Slough, for Orchids.

To The Stuart Low Co., Enfield, for Orchids.

To Sir Jeremiah Colman, Bt., V.M.H., Gatton Park, Reigate (Orchid grower, Mr. B. F. Perfect), for Orchids.

To Messrs. Dobbie, Edinburgh, for Sweet Peas.

To Mr. Elisha J. Hicks, Hurst, Reading, for Roses.

To Messrs. E. Webb, Stourbridge, for flowering plants from seeds.

To Messrs. J. Cheal, Crawley, for a formal garden.

To Messrs. Hillier, Winchester, for an informal garden.

To Messrs. John Waterer, Sons & Crisp, Bagshot, for an informal garden.

To Messrs. Clarence Elliott, Stevenage, for a rock garden.

To Mr. Amos Perry, Enfield, for a mixed group of Ferns, Tree Paeonies, Hardy Orchids and insectivorous plants.

To Messrs. Hillier, Winchester, for trees and shrubs.

To Knap Hill Nursery, Woking, for Rhododendrons and Azaleas.

To Messrs. L. R. Russell, Windlesham, for trees and shrubs, including climbers.

To Messrs. John Waterer, Sons & Crisp, Bagshot, for trees and shrubs.

To Messrs. Bakers, Codsall, for a mixed group of Delphiniums and Lupins.

To Messrs. John Waterer, Sons & Crisp, Twyford, for a mixed group of herbaceous plants, Irises and bulbous plants.

Silver-gilt Flora Medals.

To Messrs. H. G. Alexander, Tetbury, for Orchids.

To the Exors. of the late F. J. Hanbury, Esq., F.L.S., V.M.H., East Grinstead (Orchid grower, Mr. S. Farnes), for Orchids.

To Messrs. Wakeley Bros., 74 Bankside, S.E. 1, for Tulips.

To Messrs. Ben. R. Cant, The Old Rose Gardens, Colchester, for Roses.

To Messrs. Dobbie, Edinburgh, for Antirrhinums.

To Messrs. J. Burley, Upper Richmond Road, S.W. 15, for a formal garden.

To Messrs. W. Cutbush, Barnet, for an informal garden.

To International Gardens, Hendon Way, N.W., for a garden.

To Messrs. G. Jackman, Woking, for a formal garden.

To Mr. James MacDonald, Harpenden, for a formal grass garden.

To Messrs. Pulham, Newman Street, W., for a rock garden.

To Messrs. J. Cheal, Crawley, for Rhododendrons, Azaleas and other shrubs.

To Donard Nursery Co., Newcastle, co. Down, for shrubs.

To Messrs. John Peed, West Norwood, S.E., for greenhouse plants.

To Orpington Nurseries, Orpington, for Irises.

Silver-gilt Banksian Medals.

To Messrs. Mansell & Hatcher, Rawdon, for Orchids.

To Messrs. Daniels, Norwich, for Tulips.

To Mr. H. J. Jones, Ryecroft Nurseries, Lewisham, for Hydrangeas.

To Mr. G. H. Dalrymple, Bartley, Southampton, for a mixed group of Primulas, Auriculas and Meconopsis species.

To Messrs. W. Cutbush, Barnet, for a Rose garden.

To Hocker Edge Gardens, Cranbrook, for a rock garden.

To Mr. Ian G. Walker, South Godstone, for a rock garden.

To Messrs. Hollamby's Nurseries, Groombridge, for Rhododendrons, Azaleas and other shrubs and trees.

To The Stuart Low Co., Enfield, for greenhouse plants.

To the Exors. of the late Mr. R. C. Notcutt, Woodbridge, for trees and shrubs.

To Messrs. G. Reuthe, Keston, for shrubs, including Rhododendrons.

To Mr. G. G. Whitelegg, Chislehurst, for Azaleas.

To Messrs. G. Bunyard, Maidstone, for Irises.

To Messrs. Hewitt, Stratford-on-Avon, for a mixed group of Thalictrums, Delphiniums and Lupins.

To Messrs. Konynenburg & Mark, Noordwyk, Holland, for Gladioli.

To Messrs. J. R. Pearson, Lowdham, for a mixed group of Tulips, Hydrangeas, Dahlias and Irises.

To Messrs. Wm. Wood, Taplow, for herbaceous plants.

Silver-gilt Hogg Medals.

To Messrs. G. Bunyard, Maidstone, for Apples.

To Messrs. T. Rivers, Sawbridgeworth, for fruit trees in pots.

Silver Lindley Medal.

To Messrs. Hillier & Sons, Winchester, for an exhibit of Rose species.

Silver Flora Medals.

To Messrs. Harry Dixon, Wandsworth Common, for Orchids.

To C. S. & A. J. W. Browning, Cheam, for Orchids.

To Messrs. H. Prins, Wisbech, for a mixed group of Tulips and other bulbous plants.

To Ashington Nurseries, Ashington, for Carnations.

To Messrs. Frank Cant, Colchester, for Roses.

To Messrs. C. Engelmann, Saffron Walden, for a mixed group of Gerberas Zinnias and Marigolds.

To Brookside Nurseries, Headington, for rock garden plants.

To Mr. Ernest Ladhams, Godalming, for rock garden plants.

To Mr. Amos Perry, Enfield, for aquatic plants.

To Messrs. Frank Cant, Colchester, for a Rose garden.

To Surrey Nurseries, North Cheam, for a formal garden.

To Messrs. Bedford & Page, Trumpington, for a rock garden.

To Mr. Granville B. Ellis, Sunningdale, for a rock garden.

To Mr. Reginald Kaye, Wilverdale, Carnforth, for a rock garden.

To Messrs. A. Charlton, Rotherfield, for trees and shrubs.

To Messrs. A. Charlton, Rotherfield, for Rhododendrons, Azaleas and Japanese Maples.

To Messrs. Robert Green, Crawford Street, W., for Bay trees.

To Mr. Ernest Ladhams, Godalming, for a mixed group of shrubs, herbaceous and aquatic plants.

To Messrs. Pennell, Lincoln, for a mixed group of Clematis and Statices.

To Messrs. L. R. Russell, Windlesham, for a mixed group of Azaleas and Tree Ferns.

To His Grace the Duke of Richmond and Gordon, Goodwood, Chichester (gr. Mr. S. Capon), for *Richardia Pentlandii.*

To Messrs. Allwood, Haywards Heath, for Pinks.

To Messrs. Barr, King Street, W.C. 2, for a mixed group of herbaceous and bulbous plants.

To Mrs. D. Bucknall, Doneraile, Co. Cork, for a mixed group of *Habranthus pratensis* and Anemones.

To Messrs. Carter Page, London Wall, E.C. 2, for Dahlias.

To Messrs. G. & A. Clark, Dover, for a mixed group of herbaceous and bulbous plants.

To Messrs. Dobbie, Edinburgh, for Dahlias.

To Mr. James Douglas, Great Bookham, for Border Carnations.

To Mr. G. R. Downer, Chichester, for Lupins.

To Messrs Robert Green, Crawford Street, W. 1, for bedding plants.

To Messrs. Kelway, Langport, for a mixed group of herbaceous and tree Paeonies, Delphiniums, Pyrethrums and Ranunculuses.

To Messrs. M. Prichard, Christchurch, for Lupins and other herbaceous plants.

To Messrs. Redgrove & Patrick, Seal, Sevenoaks, for a mixed group of herbaceous plants and Lilies.

To Suffolk Seed Stores, Woodbridge, for herbaceous plants.

Silver Banksian Medals.

To F. E. Griggs, Esq., Chislehurst (gr. Mr. R. J. Cox), for Orchids.

To Messrs. R. H. Bath, Wisbech, for Tulips.

To Messrs. A. Dawkins, King's Road, S.W. 10, for Tulips.

To Messrs. C. Engelmann, Saffron Walden, for Pansies.

To The Stuart Low Co., Enfield, for Carnations.

To Messrs. Napier, Taunton, for Carnations.

To Messrs. D. Prior, Colchester, for Roses.

To Messrs. Ryder, St. Albans, for flowering plants from seed.

To Mr. J. Stevenson, Poole Road, Wimborne, for Sweet Peas.

To Swanley College, Swanley, for greenhouse plants.

To Hocker Edge Gardens, Cranbrook, for alpine house plants.

To Messrs. W. E. Th. Ingwersen, East Grinstead, for alpine house plants.

To Messrs. Oliver & Hunter, Moniaive, Dumfriesshire, for a mixed group of rock garden plants and Lilies.

To Messrs. M. Prichard, Christchurch, for rock garden plants.

To Messrs. W. H. Rogers, Bassett, Southampton, for rock garden plants.
To Messrs. John Waterer, Sons & Crisp, Twyford, for rock garden plants.
To Mr. G. E. Welch, Cambridge, for rock garden plants.
To Messrs. Wm. Wood, Taplow, for rock garden plants.
To Mr. F. L. White, Polegate, for a formal garden.
To Messrs. W. E. Th. Ingwersen, East Grinstead, for a rock garden.
To Mr. E. J. Jacobs, Headington, for a rock garden.
To Messrs. J. Robinson, North Park, Eltham, for a rock garden.
To Messrs. J. C. Allgrove, Langley, for a mixed group of shrubs and herbaceous plants.
To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for shrubs and trees.
To Mr. John Klinkert, Richmond, for topiary work.
To Mr. W. J. Marchant, Stapehill, Wimborne, for trees and shrubs.
To the Exors. of the late Mr. R. C. Notcutt, Woodbridge, for Rhododendrons, Azaleas and other shrubs and trees.
To Messrs. D. Stewart, Ferndown Nurseries, nr. Wimborne, for a mixed group of Rhododendrons, Azaleas and shrubs.
To Messrs. R. Veitch, Alphington, nr. Exeter, for trees and shrubs.
To Messrs. Allwood, Haywards Heath, for Pinks and Dianthus hybrids.
To Mr. F. J. Bell, Whitley Bay, for Violas and Pansies.
To Messrs. Thomas Carlile (Loddon Nurseries), Twyford, for Lupins.
To Mr. Stuart Ogg, Swanley, for Dahlias.
To Mr. J. B. Riding, Chingford, for Dahlias.
To Mr. G. G. Whitelegg, Chislehurst, for Irises.

Flora Medals.

To Messrs. Ryder, St. Albans, for Tulips.
To Mr. H. A. Brown, South Chingford, for Fuchsias.
To Mr. James Douglas, Great Bookham, for Auriculas.
To Messrs. C. Gregory, Chilwell, Nottingham, for Roses.
To Studley College, Warwickshire, for Canterbury Bells.
To Messrs. R. Tucker, Faringdon, for Roses.
To Messrs. Watkins & Simpson, Drury Lane, W.C., for a mixed group of Nierembergias and Stocks.
To Messrs. Wood & Ingram, Huntingdon, for Roses.
To Alpine Nurseries, Wimborne, for rock garden plants.
To Messrs. Bedford & Page, Trumpington, for trough gardens.
To Messrs. Clarence Elliott, Stevenage, for rock garden plants.
To Mr. A. Hansen, New Barnet, for Sempervivums.
To Mr. Reginald Kaye, Silverdale, Carnforth, for rock garden plants.
To Letchworth Plants, Ltd., Letchworth, for rock garden plants.
To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.
To Messrs. G. Reuthe, Keston, for rock garden plants.
To Mr. R. V. Roger, Pickering, for rock garden plants.
To Baggesen's Nurseries, Pembury, nr. Tunbridge Wells, for Rhododendrons and other shrubs.
To Messrs. Gurteen & Ritson, Three Bridges, for Roses.
To Messrs. W. T. Neale, Durrington, for a mixed group of Cacti, succulents and Gazanias.
To Walton Park Nurseries, Walton-on-Thames, for Rhododendrons, Azaleas, and other flowering shrubs and Conifers.
To Yokohama Nursery, Kingsway, W.C., for Japanese dwarf trees.
To Gayborder Nurseries, Melbourne, Derbyshire, for herbaceous plants.
To Messrs. L. A. Lowe, Crawley Down, for Border Carnations.
To Messrs. J. F. Spencer, Hockley, for Dahlias.
To Messrs. Toogood, Southampton, for a mixed group of Gladioli, bulbous Irises and Lilies.

Banksian Medals.

To Messrs. G. Bunyard, Maidstone, for old Roses.
To Misses A. & M. Cadell, Longniddry, for Roses.
To W. A. R. Clifton, Chichester, for Zonal Pelargoniums.
To Mr. F. Everitt, Enfield Lock, for greenhouse plants.
To Mr. E. B. Le Grice, North Walsham, for Roses.
To Messrs. G. F. Letts, Hadleigh, for Roses.
To Mr. T. Robinson, Carlton, Nottingham, for Roses.
To Messrs. Stark & Son, Fakenham, for a mixed group of Iceland Poppies, Statices and Sweet Peas.
To Messrs. C. Wall, Bath, for Aquilegias.
To Messrs. Wheatcroft, Nottingham, for Roses.
To Abercorn Nurseries, Chelmsford, for rock garden plants.

To Messrs. Bakers, Codsall, for rock garden plants.
To Messrs. Bowell & Skarratt, Cheltenham, for rock garden plants.
To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for trough gardens.
To Messrs. J. Cheal & Sons, Crawley, for rock garden plants.
To Chez Nous Nurseries, Newick, for rock garden plants.
To Mr. A. Corderoy, Eltham, for rock garden plants.
To Dartington Hall, Ltd., Totnes, for rock garden plants.
To Messrs. John Forbes, Hawick, for a mixed group of rock garden and herbaceous plants.
To Mrs. K. Hopkinson, Coulsdon, for rock garden plants.
To Mr. Amos Perry, Enfield, for rock garden plants.
To Messrs. Redgrove & Patrick, Seal, Sevenoaks, for rock garden plants.
To Messrs. J. Robinson, North Park, Eltham, for rock garden plants.
To Mr. W. Wells, junr., Merstham, for rock garden plants.
To Mr. G. E. P. Wood, Ashtead, for rock garden plants.
To Messrs. R. Gill, Penryn, for Rhododendrons.
To Messrs. W. G. Haskins, Bournemouth West, for Clematises and other shrubs.
To Mr. L. Lawrence, Taplow, for Cacti and succulents.
To Messrs. Maxwell & Beale, Broadstone, for a mixed group of Heaths and Dwarf Conifers.
To the Men of the Trees, Jay Mews, S.W. 7, for a group of trees.
To Messrs. John Scott, Merriott, for shrubs and trees.
To W. G. Theobald, Esq., Steyning (gr. Mr. R. W. Baker), for Cotyledons and Echeverias.
To Messrs. T. Yano, Granville Place, W., for Japanese miniature trees.
To Messrs. G. Bunyard, Maidstone, for herbaceous plants.
To Messrs. Gibson, Cranleigh, for a mixed group of Dahlias, Pinks, Irises and Pelargoniums.
To Messrs. Harkness, Leeming Bar, for Lupins and other herbaceous plants.
To Highfield Nursery, Enfield, for Pansies and Violas.
To Mr. A. Miles, Bickley, for a mixed group of herbaceous and rock garden plants.
To Mr. F. Rich, Worcester, for herbaceous plants.
To Mr. T. Robinson, Carlton, Nottingham, for Dahlias.
To Messrs. T. Simmons, Nether Street, N. 3, for Violas.
To Mr. W. Wells, junr., Merstham, for Lupins.

Hogg Medal.

To the Waterperry Horticultural School, Wheatley, for Strawberries.

Competitive Exhibits.

The Orchid Challenge Cup, for the best group of Orchids shown in a space not exceeding 45 square feet.

Awarded to C. S. and A. J. W. Browning, Cheam, Surrey.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

JUNE 8, 1938.

SEWELL MEDAL COMPETITION.

The Sewell Medal for the best exhibit of three pots or pans of plants suitable for the rock garden or alpine house, exhibited by an amateur, was awarded to G. H. Berry, Esq., Ridgeway, Enfield.

In conjunction with the Iris Group Meeting, a Lecture was given by Mr. G. P. BAKER, V.M.H., on " Irises for Beginners." Chairman, Mr. G. L. PILKINGTON.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and six other members present.

Axillary bulb of Tulip.—Mr. A. Grove showed a Tulip stem with a well-developed bulb in the axil of the lowest leaf.

Tubercle on root of Ceanothus.—Mr. A. D. Cotton showed a large tubercle, about 4 inches in diameter, growing on the root of a Ceanothus, apparently produced by the repeated branching of roots. This has been attributed to the presence of *Frankia Ceanothi,* and has been reported from America, but seems to be new to Britain.

The galls were first described by Professor G. F. Atkinson (Bull. Torr. Bot. Club, xix, 171, 1892) on *Ceanothus americanus.* They arise as lateral outgrowths on young roots, usually on the tap-roots, and after some years they develop into a branched dendroid body. The older portions of the gall become dark, but the new annual growth is flesh-coloured. The fungus resembles that found in Alder (*Frankia Alni*), but was regarded as a distinct species, namely *Frankia Ceanothi.* Atkinson stated that the galls were very common on certain species of *Ceanothus* in various parts of America.

Professor Bottomley stated that when the organism, which he believed belonged to the *Bacillus radicicola* group, was isolated and grown in pure culture, it could fix free atmospheric nitrogen (Annals of Botany, xxix, 615, 1915). I am not sure if this has been confirmed.

Aberrant Aquilegia.—Dr. Barnes showed an Aquilegia flower showing phyllody of all parts. A few anthers were developed, but the carpels were open.

Foliose calyx in *Primula Bulleyana,* very similar to those frequent in the common Primrose, was shown by Mr. Chittenden.

Incarvillea lutea.—An Incarvillea collected by Capt. Kingdon Ward (K.W. 5623) was shown by Mr. F. C. Stern. It agreed with *I. lutea* but was large for that species.

Centaurea Clementei, so named at the British Museum, was shown by Mr. Collingwood Ingram.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and nine other members present.

Exhibits.

Mr. C. J. Gleed, The Castle, Winchester : Strawberry ' Early Cambridge.'
R.H.S. Commercial Fruit Trials, Wisley : Plum ' Early Laxton.'

FLORAL COMMITTEE A.—Mr. D. INGAMELLS in the Chair, and eight other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Dobbie, Edinburgh, for Sweet Peas.

Silver-gilt Flora Medal.

To Messrs. Baker, Wolverhampton, for Lupins.

To Messrs. Waterer, Sons & Crisp, Twyford, for Irises.

Silver-gilt Banksian Medal.

To Messrs. W. H. Simpson, Birmingham, for Lupins.

Silver Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for Irises and Delphiniums.

To Orpington Nurseries, Orpington, for Irises.

To Suffolk Seed Stores, Woodbridge, for herbaceous plants.

Silver Banksian Medal.

To Messrs. Barr, London, for Irises, Lupins, etc.

To Messrs. Bunyard, Maidstone, for Irises.

To Messrs. Kelway, Langport, for Pyrethrums, Paeonies, etc.

To Messrs. Low, Enfield, for Fuchsias, Carnations and other greenhouse plants.

To Rev. Canon Meyer, Little Gaddesden, for Irises.

To Mr. A. Perry, Enfield, for Irises.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Engelmann, Saffron Walden, for Carnations and Zinnias.

Banksian Medal.

To Messrs. Bunyard, Maidstone, for Roses.

To Mr. E. Ladhams, Elstead, for herbaceous plants and shrubs.

To Mr. A. Paget, Headcorn, for Hydrangeas.

To Mr. G. G. Whitelegg, Chislehurst, for Irises.

Selected for trial at Wisley.

Viola 'Danson Blue,' from W. Prentice, Esq., Bexleyheath.

Other Exhibits.

Mr. E. Dixon, Putney : Lupins, Pinks, etc.

Mr. C. C. Jensen, Hoddesdon : Begonia 'Gustav Lind.'

Mr. H. G. Longford, Marcham : Lupins and Ranunculi.

Mrs. D. R. Moore, Farnborough : Pelargoniums.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. A. Charlton, Tunbridge Wells, for flowering shrubs.

Flora Medal.

To Messrs. Hollamby's Nurseries (Groombridge), Groombridge, for Rhododendrons and shrubs.

To Messrs. G. Jackman, Woking, for Clematis and shrubs.

To Messrs. M. Prichard, Christchurch, for rock plants.

To Messrs. L. R. Russell, Windlesham, for Maples, Azaleas, etc.

Banksian Medal.

To Messrs. Burkwood & Skipwith, Kingston-on-Thames, for flowering shrubs.

To Mr. J. Klinkert, Richmond, for clipped Box bushes.

To Messrs. W. Rogers, Southampton, for flowering shrubs and rock plants.

Award of Merit.

To *Lilium* × *Beerensii* as a hardy flowering plant (votes 13 for), from D. Boyes, Esq., Huntingdon Road, Cambridge. See p. 399.

Other Exhibits.

The Viscountess Byng of Vimy, Thorpe-le-Soken : *Phlox carolina.*

Mr. A. Corderoy, Eltham : rock garden plants.

N. G. Hadden, Esq., Porlock : *Erica baccans.*

Mrs. K. Hopkinson, Coulsdon ; rock garden plants.

C. Ingram, Esq., Benenden : *Centaurea sp.*

Messrs. W. T. Neale, Durrington : Cacti and succulent plants.

Messrs. L. R. Russell, 'Windlesham: *Billbergia rosea marginata, Polygala myrtifolia.*

F. C. Stern, Esq., F.L.S., Goring-by-Sea: *Incarvillea lutea.*

Messrs. J. Southgate, New Malden: Cacti and succulent plants.

Messrs. Unwin Bros., Burnham, Bucks.: rock garden plants.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and twelve other members present.

Awards Recommended:—

Award of Merit.

To *Odontonia* × 'Ceylon Ruby' var. 'Colombo' (*Odontonia* × 'Avril Gay' × *Odontonia* × 'Nestor') (votes 10 for), from Messrs. Charlesworth, Haywards Heath. See p. 400.

To *Lycaste Locusta*, Sander's var. (votes unanimous), from Sir Jeremiah Colman, Bart., Gatton Park, Reigate.

Lindley Medal.

To Ernest R. Ashton, Esq., Broadlands, Tunbridge Wells (Orchid grower, Mr. A. Everest), for *Brassia verrucosa*, a well-cultivated specimen bearing 14 many-flowered spikes.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath: a group of Orchids.

Messrs. Sanders, St. Albans: a group of Orchids.

Messrs. Armstrong & Brown, Tunbridge Wells: a group of Orchids.

Hon. H. S. Tufton, Castle Hill, Englefield Green: *Vuylstekeara* × 'Carminea.'

H. S. Wharton, Esq., Shalston, Templewood Avenue, N.W. 3: *Odontoglossum* × 'Ascania' *sulphureum.*

JOINT IRIS COMMITTEE.—Mr. F. C. STERN, F.L.S., in the Chair, and eleven other members present.

Selected for trial at Wisley.

Iris 'Juliana,' shown by F. C. Stern, Esq., F.L.S., Highdown, Goring-by-Sea.

Iris seedlings R. 19. B, P. 3, and S. 14. d, all shown by G. L. Pilkington, Esq., Lower Lee, Woolton, Liverpool.

Other Exhibits.

A. J. Wise, Esq., Merrow, Guildford: Irises 'Senorita,' 'Redskin,' 'Atlas,' 'Iriquois,' 'Emerson,' 'Maize,' and 'Nolly Goldsmith.'

F. W. Tomalin, Esq., Gloucester Road, Hampton: Iris seedlings Nos. 400, 422, 445, 462.

F. C. Stern, Esq., F.L.S., Goring-by-Sea: Iris 'Sorella.'

Collingwood Ingram, Esq., The Grange, Benenden: *Iris Xiphium lusitanica.*

Lady Martineau, King's Bourne, Wentworth, Surrey: Iris 'Valor.'

G. L. Pilkington, Esq., Woolton, Liverpool: Iris seedlings Nos. S. 15. A and S. 15. D.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON in the Chair, and thirteen other members present.

Awards Recommended:—

Award of Merit.

To *Rhododendron* × 'Beau Brummell' (votes unanimous), from Lionel de Rothschild, Esq., Exbury, Southampton. See p. 400.

To *R. cerasinum* (votes 10 for, 1 against), from Lt.-Col. L. C. R. Messel, Nymans, Handcross, Surrey. See p. 401.

To *R. polyandrum*, Pink var. (votes 10 for, 3 against), from Lt.-Col. L. C. R. Messel. See p. 401.

To *R.* × 'Fancy Free' (votes 9 for, 1 against), from Lionel de Rothschild, Esq. See p. 401.

Selected for trial.

R. × 'Simsodour' (*R.* × 'G. A. Sims' × *R.* × 'Purple Splendour'), from Lt.-Col. G. H. Loder, High Beeches, Handcross, Sussex.

Other Exhibits.

Capt. A. M. Talbot Fletcher, Margam Castle, Port Talbot, Glamorganshire: *R. Broughtonii* × *R. Fortunei* (unnamed).

Lt.-Col. G. H. Loder: *R. brevistylum* (**A.M.** 1933); *R.* × 'Fabia,' High Beeches var. (*R. dichroanthum* × *R. Griersonianum*); *R.* × 'Grierosplendour' (*R. Griersonianum* × *R.* × 'Purple Splendour'); and *R.* × 'Sarita Loder' (*R. Griersonianum* × *R.* × *Loderi*) (**A.M.** 1934).

Lady Martineau, Kings Bourne, Wentworth, Surrey: *R.* × 'Kings Bourne' and *R.* × 'Sir Philip,' both *R. discolor* crosses.

Lt.-Col. L. C. R. Messel: *R. phaedropum.*

Lionel de Rothschild, Esq.: *R.* × 'Sir Frederick Moore' (*R. discolor* × *R.* × 'St. Keverne') (**A.M.** 1937).

Mr. W. C. Slocock, Goldsworth, Surrey: *R.* × 'Goldsworth Orange' (*R. dichroanthum* × *R. discolor.*

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. F. C. STERN, F.L.S., in the Chair, and five other members present.

Award Recommended :—

Award of Merit.

To *Hieracium villosum* as a flowering plant for the rock garden (votes unanimous), from Messrs. M. Prichard, Christchurch. See p. 399.

Other Exhibit.

T. Hay, Esq., Hyde Park: *Craterostigma plantagineum.*

JUNE 16, 1938.

BRITISH DELPHINIUM SOCIETY'S SHOW.

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Award of Merit.

Delphiniums 'Tessa' (votes unanimous) and 'Purple Prince' (votes unanimous) as exhibition varieties, shown by Messrs. Blackmore & Langdon, Bath. See p. 399.

Selected for trial at Wisley.

Delphiniums 'Bright Eyes,' 'Lorna,' 'Violetta' and 'Purple Prince,' all from Messrs. Blackmore & Langdon, Bath.

Delphinium 'Emily Wort,' from Mrs. G. B. Wort, Upper Woodcote Village, Purley.

Delphinium 'Jill Hotblack,' from H. S. Hotblack, Esq., Cuckfield, Sussex.

Other Exhibits.

Messrs. Blackmore & Langdon, Bath: Delphiniums 'Olivia,' 'Verona,' 'Cleopatra' and 'Parma.'

JUNE 21, 1938.

SHRUB COMPETITION FOR AMATEURS.

CLASS A.—8 varieties of hardy shrubs in bloom, not more than 2 of any one genus.

First Prize, £3.

To Rt. Hon. Lord Swaythling, West End, Southampton. (Gr. Mr. F. J. Rose.)

Second Prize, £2 5*s.*

To Col. Stephenson R. Clarke, C.B., Borde Hill, Haywards Heath. (Gr. Mr. J. Fleming.)

Third Prize, £1 10*s.*

To Lionel de Rothschild, Esq., O.B.E., V.M.H., Exbury. (Grs. Mr. F. Hanger and Mr. R. Findlay.)

CLASS B.—1 vase of a hardy shrub in bloom.

First Prize, £1.

To Rt. Hon. Lord Swaythling.

Second Prize, 15*s.*

To Col. Stephenson R. Clarke, C.B.

Third Prize, 10*s.*

H. H. Crane, Esq., F.L.S., Eastcote.

A Lecture was given by Mr. E. A. BUNYARD, F.L.S., on "Old-fashioned Roses." Chairman, Hon. ROBERT JAMES.

SCIENTIFIC COMMITTEE.—Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

'Wheat-ear' Verbascum.—Dr. Barnes showed a specimen of *Verbascum phoeniceum* in which the bracts were repeated again and again in all the flowers much as in the well-known 'wheat-ear' carnation.

Magnolia rostrata.—Flowers of this uncommon Magnolia were exhibited by Col. Bolitho from his garden at Trengwainton, Penzance, and a Botanical Certificate was unanimously recommended to this plant.

The following plants referred from other committees were identified:—*Anthemis Biebersteiniana, Digitalis obscura,* and *Didissandra flabellata,* all shown by Dr. Giuseppi of Felixstowe. *Carrieria calycina* was shown in flower by Mr. Whittall of Grayswood, Surrey.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. Bunyard, F.L.S., in the Chair, and eight other members present.

Business.

Fruit for identification.

FLORAL COMMITTEE A.—Mr. G. W. Leak, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended:—

Gold Medal.

To Messrs. Bees, Chester, for herbaceous plants.

To Messrs. Blackmore & Langdon, Bath, for Delphiniums.

Silver-gilt Banksian Medal.

To Messrs. Waterer, Sons & Crisp, Twyford, for Paeonies.

Silver Flora Medal.

To Messrs. Barr, London, for herbaceous plants.

To Napsbury Hospital (gr. Mr. W. J. Jennings) for greenhouse pot plants.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Bath, Wisbech, for Delphiniums and other herbaceous plants.

To Mr. E. Ladhams, Elstead, for Water Lilies and herbaceous plants.

To Messrs. Low, Enfield, for Carnations and other greenhouse plants.

To Messrs. Prichard, Christchurch, for herbaceous plants.

Flora Medal.

To Messrs. Daniels, Norwich, for herbaceous plants.

To Messrs. Engelmann, Saffron Walden, for Carnations and Gerberas.

To Messrs. Kelway, Langport, for Paeonies and Delphiniums.

To Mr. A. Perry, Enfield, for Hemerocallis and other hardy plants.

To Suffolk Seed Stores, Woodbridge, for herbaceous plants.

Banksian Medal.

To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses.

To Messrs. Bunyard, Maidstone, for Delphiniums and Paeonies.

To Messrs. Bunyard, Maidstone, for Roses.

To Messrs. Constable, Tunbridge Wells, for Alstroemerias.

To Marsden Nurseries, Ashtead, for Dianthus and other hardy plants.

To Mr. A. Miles, Bickley, for herbaceous plants.

To Messrs. Simmons, Finchley, for Violas.

Award of Merit.

To Begonia 'Margot Lipscomb,' as a variety for exhibition (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 398.

Selected for trial at Wisley.

Dianthus 'Jewel Strain,' from Messrs. Hayward, Clacton-on-Sea.

Dianthus plumarius 'Isabel,' from Mr. E. Ladhams, Elstead.

Nepeta Mussinii var., from Messrs. Hayward, Clacton-on-Sea.

Other Exhibits.

Chez Nous Nurseries, Newick: Dianthus.

Mrs. J. Fanshawe, Moffatt: Violetta 'Mira.'

H. R. Griffin, Esq., Sidcup: Lupinus 'Carnival.'

J. K. Jones, Esq., Evesham: Pyrethrum 'Avis Mary,' to be seen again.

Mr. H. W. Mills, Uffculme: Dianthus and other hardy plants.

Messrs. Prichard, Christchurch: *Papaver orientale* 'H. Bennett.'

A. F. Sherlock, Esq., Manchester: Dianthus 'Marian.'

A. Langley Smith, Esq., Catford: Miniature Pelargoniums.

Mrs. Tayleur, Glencaple: Tree Lupins.

Messrs. Willik, Leicester: Rose 'Else's Rival.'

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Constable, Southborough, for Lilies.

To Hocker Edge Gardens, Cranbrook, for Lilies and other hardy plants.

Silver Banksian Medal.

To Messrs. Russell, Windlesham, for greenhouse foliage plants.

Flora Medal.

To Messrs. Hillier, Winchester, for flowering shrubs.

Banksian Medal.

To Mr. J. Klinkert, Richmond, for clipped trees.

To Messrs. Maxwell & Beale, Broadstone, for rock garden plants.

To Messrs. Prichard, Christchurch, for rock garden plants.

To Mr. J. Robinson, Eltham, for rock garden plants.

To Messrs. Rogers, Southampton, for rock garden plants.

To Mr. G. Welch, Cambridge, for rock garden plants.

Award of Merit.

To *Adenocarpus anagyrifolius* as a hardy flowering shrub (votes 8 for, 2 against), from F. C. Stern, Esq., F.L.S., Goring-by-Sea. See p. 398.

To *Dracocephalum Hemsleyanum* as a hardy flowering plant (votes 11 for), from L. de Rothschild, Esq., Exbury, and F. C. Stern, Esq., F.L.S., Goring-by-Sea. See p. 399.

To *Eremurus* ' Lady Falmouth ' as a hardy flowering plant (votes 7 for), from F. C. Stern, Esq., F.L.S., Goring-by-Sea. See p. 399.

To *Leptospermum lanigerum*, Giblin's Variety as a hardy flowering shrub (votes unanimous), from Lt.-Col. L. C. R. Messel, Handcross. See p. 399.

To *Malvastrum puniceum* as a tender flowering shrub (votes unanimous), from F. C. Stern, Esq., F.L.S., Goring-by-Sea. See p. 400.

To *Mimulus glutinosus* as a tender flowering plant (votes 9 for, 1 against), from Admiral A. Walker-Heneage-Vivian, Swansea. See p. 400.

To *Olearia chathamica* as a tender flowering shrub (votes 13 for), from Colonel Stephenson R. Clarke, C.B., Haywards Heath. See p. 400.

Other Exhibits.

Col. E. H. W. Bolitho, Heamoor : *Magnolia rostrata.*

Mr. A. Corderoy, Eltham : rock garden plants.

Mrs. C. H. Hext, Falmouth : *Stewartia pseudo-camellia.*

Mrs. Vera Higgins, Croydon : *Anacampseros Alstonii.*

Mrs. Hopkinson, Coulsdon : rock garden plants.

Letchworth Plants, Letchworth : rock garden plants.

Lt.-Col. Messel, Handcross : *Leptospermum nitidum, L. lanigerum, L. scoparium.*

Messrs. Prichard, Christchurch : *Kniphofia Northiae* var.

L. de Rothschild, Esq., Exbury : *Leptospermum rupestre.*

F. C. Stern, Esq., F.L.S., Goring-by-Sea : *Eremurus* ' Primrose.'

Messrs. Unwin, Burnham : rock garden plants.

Admiral A. Walker-Heneage-Vivian, Swansea : *Cestrum Parqui.*

E. F. Warburg, Esq., Epsom : *Vaccinium cylindraceum.*

Mrs. C. M. Whittall, Haslemere : *Carrierea calycina.*

ORCHID COMMITTEE.—LIONEL DE ROTHSCHILD, Esq., in the Chair, and fifteen other members present.

Awards Recommended :—

Award of Merit.

To *Odontoglossum* × ' Dauphin ' var. ' Princess Royal ' (*crispum* × ' l'Empereur ') (votes 11 for, 3 against), from Messrs. Armstrong & Brown, Tunbridge Wells. See p. 400.

To *Odontoglossum* × ' Dauphin ' var. ' Alaska ' (*crispum* × ' l'Empereur ') (votes 14 for), from Messrs. Armstrong & Brown, Tunbridge Wells. See p. 400.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group of Orchids.

Messrs. Armstrong & Brown, Tunbridge Wells : a group of Orchids.

Messrs. Stuart Low, Jarvis Brook : a group of Orchids.

Messrs. J. & A. McBean, Cooksbridge : a group of Orchids.

Sir Jeremiah Colman, Bart., Gatton Park, Reigate : *Aeranthus grandiflorus* and *Sobralia* × ' Louis Sander.'

W. F. Higgins, Esq., Croydon : *Dendrobium Williamsonii* and *Luisia Amesiana.*

JOINT IRIS COMMITTEE.—Mr. F. C. STERN, F.L.S., in the Chair, and seven other members present.

Selected for trial at Wisley.

Iris 'Madrigal,' from the Orpington Nurseries, Orpington, Kent.

Other Exhibits.

F. C. Stern, Esq., F.L.S., Highdown, Goring-by-Sea: *Iris filifolia* (**A.M.** 1915).

Messrs. Geo. Bunyard, Maidstone: *Iris Pseudo-acorus* 'Lady Jane.'

Orpington Nurseries, Orpington, Kent: Irises 'Rialto,' 'Bittersweet' and Seedling W. 182.

JOINT RHODODENDRON COMMITTEE.—Mr. J. B. STEVENSON in the Chair, and twelve other members present.

Awards Recommended:—

Award of Merit.

To *Rhododendron crassum* var. (votes 9 for), from Lt.-Col. E. H. W. Bolitho, Trengwainton, Heamoor, Penzance, Cornwall. See p. 401.

To *R. Maddenii* (votes unanimous), from Lt.-Col. E. H. W. Bolitho. See p. 401.

Other Exhibits.

Lt.-Col. E. H. W. Bolitho: *R. crassum* (**A.M.** 1934); a *R. crassum* hybrid; and *R. Maddenii*, Jenkins' var.

Lionel de Rothschild, Esq., Exbury House, Southampton: R. × 'Fire Bird' (*R. Griersonianum* × *R.* × 'Norman Shaw').

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. F. C. STERN, F.L.S., in the Chair, and eight other members present.

Award Recommended:—

Cultural Commendation.

To Dr. P. L. Giuseppi, Felixstowe, for *Dianthus haematocalyx* var. *alpinus*.

Other Exhibits.

Dr. P. L. Giuseppi, Felixstowe: *Chrysanthemum Biebersteiniana, Dianthus haematocalyx, D. haematocalyx alpinus, Didissandra flabellata, Digitalis obscura, Stylidium adnatum.*

Dame Alice Godman, Horsham: *Crepis Hieracium.*

Mr. Amos Perry, Enfield: *Liparis liliifolia.*

JOINT PERPETUAL-FLOWERING CARNATION COMMITTEE.—Mr. D. INGAMELLS in the Chair, and six other members present.

Exhibits.

Lady Brodie Henderson, Braughing, Ware: Carnation sport from 'Mary Allwood.'

The Rt. Hon. The Earl of Bessborough, Rowlands Castle: Carnation 'Stanstead White Baroness.'

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and six other members present.

Awards Recommended:—

Award of Merit.

Delphiniums 'Natalie' for exhibition (votes unanimous), (see p. 399) and 'Naomi' for exhibition (votes unanimous), both from Messrs. Blackmore & Langdon, Bath. See p. 398.

Delphiniums 'Blue Monarch' for exhibition (votes unanimous), and 'June Lady' for exhibition (votes unanimous), both shown by F. A. Bishop, Esq., Clewer Green, Windsor. See p. 398.

Selected for trial at Wisley.

Delphiniums 'Natalie' and 'Naomi' shown by Messrs. Blackmore & Langdon, Bath.

Delphiniums 'May Lang' and 'Maydee,' both shown by Mrs. Hugh Lang, Worplesdon Hill, Woking.

Other Exhibits.

Mrs. B. G. Wort, Purley, Surrey: Delphinium 'Snow White.'

Mrs. Hugh Lang, Woking: Delphinium 'Ugly Martin.'

D. J. Hulton, Esq., Steppey: Delphinium 'Hilda.'

E. W. Mooring, Esq., Witley, Surrey: Delphinium 'Pandora.'

F. A. Bishop, Esq., Clewer Green, Windsor: Delphiniums 'Windsor Lad,' 'Henrietta' and 'Queen.'

Miss E. Townsend, Answorth, Hants: seedlings.

JUNE 28, 1938.

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

First-class Certificate.

To Delphinium ' Italia ' as an exhibition variety (votes 8 for, 0 against), shown by Messrs. Blackmore & Langdon, Bath (**A.M.** 1935). See p. 398.

Award of Merit.

To Delphinium ' Mavis ' as an exhibition variety (votes 8 for, 0 against), shown by Messrs. Blackmore & Langdon, Bath. See p. 398.

To Delphinium ' Brigadier F. E. Hotblack ' as an exhibition variety (votes 8 for, 0 against), shown by H. S. Hotblack, Esq., Deaks, Cuckfield, Sussex. See p. 398.

Selected for trial at Wisley.

Delphinium ' Blue Cockade,' shown by Mrs. Hugh Lang, Worplesdon Hill, Woking.

Delphinium ' Moonstone,' shown by F. A. Bishop, Esq., Clewer Green, Windsor.

Delphinium ' Granville Bullimore,' shown by H. S. Hotblack, Esq., Cuckfield, Sussex.

Delphiniums 'Mavis,' ' Ethereal ' and ' Orpheus,' all shown by Messrs. Blackmore & Langdon, Bath.

Other Exhibits.

Mrs. Hugh Lang, Worplesdon Hill, Woking : Delphinium ' Tina Lang.'

H. P. Rumbler, Esq., Frankfort-on-Main, Germany : Delphinium ' White Seedlings.'

F. A. Bishop, Esq., Clewer Green, Windsor : Delphinium ' Enchantment.'

H. S. Hotblack, Esq., Cuckfield, Sussex : Delphinium ' Eve Robins.'

Messrs. Blackmore & Langdon, Bath : Delphiniums ' Eventide,' ' Ceres,' ' Olympus,' ' The Bride,' and ' Laura Fairbrother ' (**A.M.** 1937).

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

JULY 5, 1938.

LILY COMPETITION FOR AMATEURS.

Class A.—Six species and/or hybrids of Lilium.

First Prize, £2.

To Rt. Hon. Lord Swaythling, West End, Southampton (Gr.: Mr. F. J. Rose).

Second Prize, £1 10s.

To Mrs. N. G. Ballantine, Kilwinning, Ayrshire.

Class B.—One stem of Lilium.

First Prize, £1.

To Rt. Hon. Lord Swaythling.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and four other members present.

Gladiolus illyricus.—Miss H. M. Coley sent a specimen of *Gladiolus illyricus* gathered in a wood at Langton Maltravers, Dorset, far from a garden, thus extending the recorded range of this plant in England.

Variegated Pelargoniums.—Mr. Langley Smith sent a series of scented Pelargoniums some of which showed variegation in the foliage, with a record of their pedigrees, from which it appeared that in some families variegation was constant over several generations even though crossing with normal green plants had occurred. At times it appeared when green plants with variegations in their ancestry were crossed and at times the crossing of a variegated with a green plant gave green plants.

Knaurs in Cryptomeria japonica.—An exhibit of pear-shaped knaurs from the stem of *Cryptomeria japonica*, one of them measuring five inches long, was before the Committee.

Fasciated Phormium tenax.—Mr. R. D. Trotter sent a fasciated shoot of *Phormium tenax* in which the stem was about two inches wide.

Plants referred from other Committees included *Campanula Scheuchzeri*, *Myosotis alpestris rosea*, a Primula near *P. Poissonii* and a Lily seedling called 'Eileen Raffill' raised from *L. Davidi* apparently crossed with *L. bulbiferum* var.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and thirteen other members present.

Exhibit.

R.H.S. Commercial Fruit Trials, Wisley: Plum 'Laxton's Gage,' Strawberry 'Corvallis.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eleven other members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for Delphiniums.

Silver Banksian Medal.
To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Barr, London, for herbaceous plants.
To Messrs. Engelmann, Saffron Walden, for Carnations and Zinnias.
To Mr. E. Ladhams, Elstead, for Water-lilies and herbaceous plants.
To Messrs. Waterer, Sons & Crisp, Twyford, for *Iris Kaempferi* and Water-lilies.

Flora Medal.
To Mr. W. E. B. Archer and Daughter, Sellindge, for Roses.
To Mr. W. Braithwaite, Northallerton, for Scabious.
To Mr. E. B. LeGrice, North Walsham, for Roses.
To Messrs. Wall, Bath, for Border Carnations.

Banksian Medal.
To Messrs. Bentall, Havering, for Roses.
To Mr. J. Douglas, Great Bookham, for Border Carnations.
To Mr. E. Ladhams, Elstead, for Alstroemerias.
To Messrs. Prichard, Christchurch, for *Iris Kaempferi.*

Award of Merit.
Begonia 'Lucy Dare' as a variety for exhibition (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 444.
Begonia 'Stanley Halford Roberts' as a variety for exhibition (votes unanimous), from Messrs. Blackmore & Langdon, Bath. See p. 444.

Selected for trial at Wisley.
Dianthus Allwoodii HP 520 P (to be named) from Messrs. Allwood, Haywards Heath.
Papaver nudicaule 'Red Cardinal' from Messrs. Hurst, London.
Ursinia 'Advance,' from Messrs. Hurst, London.

The following awards were recommended after trial at Wisley.

Award of Merit.
To *Campanula persicifolia* 'Frances,' from Mr. J. Holding, Evesham. See p. 445.
To *Dianthus Allwoodii* 'Bridget,' from Messrs. Allwood, Haywards Heath. See p. 445.
To *Heuchera* 'Freedom,' from Messrs. Bloom, Oakington.
To *Heuchera* 'Oakington Jewel,' from Messrs. Bloom, Oakington.
To *Heuchera* 'Petworth,' from Mr. W. Wells, Merstham.
To *Heuchera* 'Pink Delight,' from Messrs. Bath, Wisbech.
To Viola 'Iden Gem,' from Mr. G. Murray, Staplehurst. See p. 447.

Highly Commended.
To *Heuchera* 'Corallion,' from Messrs. Bloom, Oakington.
To *Heuchera* 'Gaiety,' from Messrs. Bloom, Oakington.

Other Exhibits.
Messrs. Bunyard, Maidstone: Roses.
Mr. T. Carlile, Twyford: Delphiniums and Scabious.
Messrs. Clark, Dover: Alstroemerias and Eremuri.
Mr. F. J. Connor, Brighton: Scabiosas.
Mr. A. H. Ford, Solihull: Dianthus.
Sir Arthur W. Hill, K.C.M.G., V.M.H., Kew: Pelargoniums resulting from self fertilizing *P.* × *kewense.*
Mr. C. C. Jensen, Hoddesdon: Begonias.
Mr. E. Ladhams, Elstead: Sidalcea 'Elstead Rose.'
Mrs. D. R. Moore, Farnborough: Pelargoniums.
Mr. G. Murray, Staplehurst: Viola 'Ripple.'
Mr. A. Langley Smith, Catford: miniature Pelargoniums.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Gold Medal.
To Messrs. Constable, Southborough, for Lilies.
To Messrs. Wallace, Tunbridge Wells, for Lilies and other hardy plants.

Silver Flora Medal.
To Hocker Edge Gardens, Cranbrook, for Lilies, Gladioli, Irises, etc.

Flora Medal.
To Mr. A. Hansen, New Barnet, for rock garden plants.
To Messrs. Russell, Windlesham, for Ixoras and other greenhouse plants.

Banksian Medal.

To Mr. Stuart Boothman, Maidenhead, for rock garden plants.
To Brookside Nurseries, Oxford, for rock garden plants.
To Mr. A. Corderoy, Eltham, for rock garden plants.
To Dartington Hall, Ltd., Totnes, for rock garden plants.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Letchworth Plants, Ltd., Letchworth, for rock garden plants.
To Messrs. Southgate, New Malden, for succulents.

Lindley Medal.

To Captain E. T. R. Carlyon, Par, Cornwall, for flowering shrubs.

Award of Merit.

To *Deutzia Schneideriana* as a hardy flowering shrub (votes unanimous), from Lt.-Col. L. C. R. Messel, O.B.E., Handcross. See p. 445.

To *Lilium* ' Grayswood ' as a hardy flowering plant (votes unanimous), from the Rt. Hon. Lord Swaythling, Southampton. See p. 446.

To *Lilium* × *Dalhansonii*, Townhill var. as a hardy flowering plant (votes 7 for), from the Rt. Hon. Lord Swaythling, Southampton. See p. 446.

To *Oenothera glauca* as a hardy flowering plant (votes 12 for), from Lionel de Rothschild, Esq., Exbury. See p. 446.

To *Rhododendron facetum* as a tender flowering shrub (votes 10 for), from Admiral A. Walker-Heneage-Vivian, Swansea. See p. 446.

Preliminary Commendation.

To *Lilium* ' A. J. Harmeling ' as a hardy flowering plant (votes unanimous), from Messrs. Constable, Southborough.

To *Lilium* ' Eileen Raffill ' as a hardy flowering plant (votes unanimous), from C. P. Raffill, Esq., Kew.

Other Exhibits.

Lord Aberconway, Bodnant : Rhododendrons ' Eros ' and ' Dante.'
Messrs. Burkwood & Skipwith, Kingston : flowering shrubs.
Collingwood Ingram, Esq., Benenden : *Gladiolus* ' Juanita.'
L. de Rothschild, Esq., Exbury : *Dracocephalum sp.* Sherriff 2607.
Mrs. Stirling, Muir of Ord, Ross-shire : Primula hybrid.
The Rt. Hon. Lord Swaythling, Southampton : *Lilium Bolanderi.*
R. D. Trotter, Esq., Ockley : fasciated inflorescence of *Phormium tenax.*
Admiral A. Walker-Heneage-Vivian, Swansea : *Callistemon lanceolatus.*
Messrs. Wallace, Tunbridge Wells : *Lilium Thunbergianum* ' The President.'

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and eight other members present.

No awards were made to Orchids on this occasion.

Exhibit.

Messrs. Charlesworth, Haywards Heath : *Vuylstekeara* × ' Aranda.'

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. F. C. STERN, F.L.S., in the Chair, and six other members present.

Awards Recommended :—

Award of Merit.

To *Wahlenbergia Wettsteinii* as a flowering plant for the rock garden and alpine house (votes unanimous), from Mrs. H. P. Thompson, Weybridge. See p. 447.

Other Exhibits.

N. G. Baguley, Esq., Banstead : *Saxifraga exarata* var. *pyrenaica.*
Dr. P. L. Giuseppi, Felixstowe : *Centaurea macrorhiza, Hypericum cuneatum.*
Messrs. M. Prichard, Christchurch : *Campanula filicaulis, C. pusilla* (3 vars.), *C. Scheuchzeri, Inula Rhizocephala, Myosotis alpestris rosea, Veronica spicata* form (?).

JOINT BORDER CARNATION COMMITTEE.—Mr. E. CHARRINGTON in the Chair, and six other members present.

Awards Recommended :—

Award of Merit.

To Carnation ' Olive ' as an exhibition variety (votes unanimous), from Messrs. C. Wall, Melrose Nurseries, Bath. See p. 445.

Preliminary Commendation.
To Carnation 'Jeannie Thain' (votes unanimous), from R. Thain, Esq., Guildown Avenue, Guildford.

Selected for trial at Wisley.
Carnation 'Olive,' from Messrs. C. Wall, Bath.
Carnation 'Jeannie Thain' from R. Thain, Esq., Guildford.

Other Exhibits.
C. Smith, Esq., Mansfield Woodhouse, Notts.: Carnation 'Eileen Smith.'
E. Charrington, Esq., Limpsfield, Surrey: Carnation 'Allflower.'

JOINT DELPHINIUM COMMITTEE.—Mr. T. HAY, V.M.H., in the Chair, and seven other members present.

Selected for trial at Wisley.
Delphinium 'Darkie,' from Miss C. I. Marshall, Sallwood Heath, Kent.
Delphinium K.W. 12404, from Miss Henderson, Billingshurst.
Delphinium 'Bridesmaid,' from Messrs. Blackmore and Langdon, Bath.

Other Exhibits.
Messrs. Blackmore and Langdon, Bath: Delphiniums 'Lady Wightman' and 'Dainty.'
Messrs. Oliver and Hunter, Moniaive, Dumfriesshire: Delphinium Seedling.

JULY 12, 1938.

JOINT BORDER CARNATION COMMITTEE.—Mr. L. NOËL SUTTON in the Chair, and ten other members present.

Awards Recommended:—
Award of Merit.
To Border Carnations 'Downs Glory' and 'Downs Favourite' as varieties for exhibition (votes 8 for, 0 against), from Messrs. Allwood, Haywards Heath, Sussex. See p. 444.
To Border Carnation 'Winifred Knapton,' as an exhibition variety (votes 8 for, 0 against), from H. A. Knapton, Esq., Fairfield Road, Orpington. See p. 445.

Preliminary Commendation.
To Border Carnations 'Downs Charm' and 'Downs Delight,' both from Messrs. Allwood.
To Border Carnation 'Ruth Sparey,' from H. A. Knapton, Esq.
To Border Carnation 'Jean Batten,' from E. Charrington, Esq., Limpsfield, Surrey.

Selected for trial at Wisley.
Border Carnations 'Downs Maid,' 'Downs Beauty,' 'Downs Glory,' 'Downs Mist,' 'Downs Favourite,' 'Downs Charm,' Downs Delight,' and 'Blushing Bride,' all from Messrs. Allwood.
Border Carnation 'William R. Hill,' from C. F. Hill, Esq., 49 Carlton Road, Small Heath, Birmingham.
Border Carnation 'Ruth Sparey,' from H. A. Knapton, Esq.
Border Carnation 'Jean Batten,' from E. Charrington, Esq.

Other Exhibits.
Messrs. Allwood: Border Carnations 'Cottage Triumph' and 'Downs Brilliant.'
C. Smith, Esq., Mansfield Woodhouse, Notts.: Border Carnations 'Kathie Smith' and 'Doris Smith.'
C. F. Hill, Esq.: Border Carnations 'A. C. Bartley' and 'Mrs. Malvina Souch.'
H. A. Knapton, Esq.: Border Carnation 'Ena Elliott.'

JULY 16, 1938.

JOINT DELPHINIUM COMMITTEE (at Alderley Edge Show).—Mr. T. HAY, V.M.H., in the Chair, and eight other members present.

Selected for trial at Wisley.
Delphinium 'Clematis,' from H. Bateman, Esq., Jodrell Bank, Holmes Chapel, Cheshire.

JULY 19, 1938.

CLAY CUP COMPETITION.

The Clay Challenge Cup, which was offered for award for a new Rose possessing the true old rose scent, was not awarded.

NEW HYBRID LILY COMPETITION.

JULY 5 and JULY 19, 1938.

The Banksian Medal offered for award for the best new hybrid Lily was awarded to Rt. Hon. Lord Swaythling, Southampton, for *Lilium* × *Dalhansonii*, Townhill Variety, which he exhibited on July 5.

LILY COMPETITION FOR AMATEURS.

One Stem of Lilium, cut or on plant.

First Prize, £1.
To Rt. Hon. Lord Swaythling, Southampton.

Second Prize, 15*s*.
To Mrs. M. Hosking, Weybridge.

Third Prize, 10*s*.
To Hon. Lewis Palmer, West Hoathly.

A lecture by the late Mr. D. B. CRANE, on "Violas and Pansies," was read by Mr. G. W. LEAK, V.M.H.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and five other members present.

Odontioglossum × *Jacquinetta*, '*Roma Hurst*.'—Dr. Hurst showed a specimen of this hybrid, the eighth generation from the original cross, showing the influence in a remarkable way in texture and other characters of *O. triumphans*, which came in five generations before, and nothing of *O. crispum*, which took part in the composition of 77½ per cent. of its ancestry.

Silver-Leaf in Apple.—Mr. J. W. Odell showed a shoot of apple with very silvery leaves, but it could not be certainly said that the appearance was due to the attack of *Stereum purpureum*.

Plantago maritima as a vegetable.—A letter was received from Mr. George Fraser of Ucluelet, B.C., enclosing a newspaper article and drawing attention to the use of *Plantago maritima* as a vegetable. It grows on the rocks thinly covered by sand and gravel on the British Columbia coast. The Indians made no use of it, but it appears to be eaten in Oregon and the seeds are advertised as "Spring Greens."

Eryngium variifolium.—Dame Alice Godman showed a species of Eryngium from Morocco later identified at Kew as *E. variifolium*.

Nicotiana glauca, an Argentine species, was shown by Mrs. Blaythwayt. Prof. Goodspeed said that a mahogany-coloured form had recently been found, much more ornamental than the yellow-flowered form which was the common one.

Knaur on Prunus Avium.—Mr. Bowles showed a small knaur from the stem of *Prunus Avium*, much like that shown at the last meeting, but smaller.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and eight other members present.

Award Recommended :—

Cultural Commendation.

To Mr. E. Humphries (gr. to R. W. F. Cartwright, Esq.), Aynho Park, nr. Banbury, Oxon, for twenty-four fruits of Peach 'Peregrine' and Nectarine 'Pine Apple.'

Other Exhibits.

R.H.S. Commercial Fruit Trials, Wisley: Black Currants 'Blacksmith,' 'Goliath,' 'Gresham Black,' 'Invincible,' 'Giant Prolific,' 'Seabrook's Black' and 'Supreme.'

Samples of fruit from the Australian and South African Citrus Fruits in Season Exhibit, staged by Imperial Fruit Show, Ltd.

Mr. T. E. Smiles, Chartway Street, East Sutton, nr. Maidstone: Strawberry 'Aromatic.'

FLORAL COMMITTEE A.——Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. Daniels, Norwich, for Larkspurs.

Silver-gilt Banksian Medal.

To the Donard Nursery Co., Newcastle, co. Down, for varieties of *Dierama pulcherrimum.*

Silver Flora Medal.

To Messrs. Allwood Bros., Haywards Heath, for Border Carnations and Allwoodii Pinks.

To Messrs. Dicksons, Newtownards, co. Down, for Roses.

To Mr. E. Ladhams, Ltd., Elstead, near Godalming, for herbaceous plants.

Silver Banksian Medal.

To Messrs. Barr, Taplow, for Phlox and other herbaceous plants.

To Mr. F. J. Bell, Whitley Bay, Yorks, for Pansies and Violas.

To Messrs. B. R. Cant, Colchester, for Roses.

To Messrs. F. Cant, Colchester, for Roses.

To Mr. A. Harvey, Friars Court, Shoreham, for Coleus.

To Messrs. M. Prichard, Christchurch, for herbaceous plants.

Flora Medal.

To Mr. C. Engelmann, Saffron Walden, for Carnations.

Banksian Medal.

To Mr. W. E. B. Archer and Daughter, Sellindge, for Roses.

To Messrs. J. & A. Bentall, Havering-atte-Bower, for Roses.

To Mr. T. Carlile, Twyford, for herbaceous plants.

To Messrs. G. & A. Clark, Dover, for herbaceous plants.

To the Donard Nursery Co., for varieties of *Iris Kaempferi.*

To Mr. E. B. Le Grice, North Walsham, for Roses.

To Messrs. S. McGredy, Portadown, N. Ireland, for Roses.

Award of Merit.

To *Dierama pulcherrimum* var. ' Falcon ' as a hardy border plant (votes 12 for), from the Donard Nursery Co. See p. 446.

To Rose ' Poulsen's Pink ' as a polyantha bedding variety (votes 12 for), from Messrs. S. McGredy & Sons, Portadown, N. Ireland. See p. 446.

Selected for trial at Wisley.

Chrysanthemum maximum ' Everest,' from Mr. F. Yeoman, Northallerton, Yorks.

Chrysanthemum maximum ' Pauline,' from Mr. H. P. Read, Brundall, Norfolk.

Chrysanthemum segetum ' Goldstone,' from Messrs. Hurst & Sons, 152 Houndsditch, London, E.C. 3.

Heliopsis gigantea, from Mr. T. Carlile, Loddon Nurseries, Twyford.

Other Exhibits.

Messrs. Bunyard, Maidstone : old-fashioned Roses.

Gardens Dept., Dartington Hall, Ltd., Totnes : *Fuchsia* ' Peter Pan.'

Donard Nursery Co. : *Dierama pulcherrimum* var. ' Flamingo.'

Mr. R. H. Hall, Worthing : *Pelargonium* ' Apple Blossom.'

Messrs. P. S. Hayward, Clacton-on-Sea : *Chrysanthemum maximum* vars. ' Lady Blanche ' and ' Lilt.'

Mrs. K. Hopkinson, Coulsdon : herbaceous and rock garden plants.

Mr. C. A. Jardine, Feltham, Middlesex : Violas.

Mr. E. Ladhams : *Alstroemeria haemantha* × *A. Ligtu,* Ladham's strain.

Mr. R. D. Lainson, Piltdown, Sussex : Gazanias.

Letchworth Plants, Letchworth : herbaceous plants.

Mr. E. B. Le Grice, North Walsham : Roses ' Jill ' and ' Little Miss Muffet.'

Messrs. S. McGredy Portadown, N. Ireland : Rose ' Lady Moyra Cavendish.'

Messrs. Neale, Solihull : Dahlias ' Peach Elegance ' and ' Trill.'

Mr. H. P. Read : *Chrysanthemum maximum* ' Horace Read ' (**A.M.** 1937).

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver Flora Medal.

To Hocker Edge Gardens, Cranbrook, for Lilies and other hardy plants.

Flora Medal.

To Mr. A. Hansen, New Barnet, for rock garden plants.

Banksian Medal.

To Messrs. Burkwood & Skipwith, Kingston, for flowering shrubs.
To Mr. A. Corderoy, Eltham, for rock garden plants.
To Dartington Hall, Ltd., Totnes, for rock garden plants.
To Mr. R. Kaye, Silverdale, for rock garden plants.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Messrs. Russell, Windlesham, for Nymphaeas and other hardy plants.
To Messrs. Southgate, New Malden, for succulents.

First Class Certificate.

To *Genista aethnensis* as a hardy flowering shrub (votes 10 for), from the Exors. of the late R. C. Notcutt, Woodbridge. See p. 446.

Award of Merit.

To *Cladrastis sinensis* as a hardy flowering tree (votes 11 for, 1 against), from Major George Johnstone, Grampound Road, Cornwall. See p. 445.

To *Rhododendron* × 'Argosy' var. 'Snow White' as a hardy flowering shrub (votes 10 for, 2 against), from Messrs. J. Waterer, Sons & Crisp, Bagshot. See p. 446.

Preliminary Commendation.

To *Lilium dauricum pardinum flavum* as a hardy flowering plant (votes unanimous), from Messrs. W. A. Constable, Southborough.

Other Exhibits.

Mrs. Hiatt Baker, Bristol: *Melia Azedarach.*
Mrs. Blathwayt, West Porlock: *Nicotiana glauca.*
Messrs. Carlile, Twyford: *Lavandula Spica alba nana.*
George Cave, Esq., Stevenage: *Lilium* 'Evelyn Cave.'
Messrs. Constable, Southborough: *Lilium Leichtlinii.*
Dartington Hall, Ltd., Totnes: *Primula Poissonii.*
Dame Alice Godman, D.B.E., Horsham: *Eryngium variifolium, Lilium* sp. E.K.B. 3595.
Major G. Johnstone, Grampound Road: *Clethra Delavayi.*
The Director, R.B.G., Kew: *Verbascum banaticum.*
The Hon. Mrs. Ryder, Lymington: *Erica glomiflora.*
F. C. Stern, Esq., F.L.S., Goring-by-Sea: *Lilium* 'Shuksan.'
H. J. Talbot, Esq., Uxbridge: *Rhododendron micranthum.*
Messrs. Waterer, Bagshot: hybrids of *Rhododendron auriculatum* × *R.* 'Mrs. J. Kelk.'
His Honour Judge Woodcock, K.C., Hampstead: *Lilium* × *aurelianense.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and ten other members present.

Award Recommended:—

Cultural Commendation.

To R. J. Salmon, Esq., 'Woodslee,' Houndsden Road, Winchmore Hill, N. 21, for *Odontoglossum* × 'Zulu' (*eximium* × *Harryanum*), with a tall spike of fifteen flowers.

Other Exhibits.

Capt. the Hon. H. R. Broughton, Bakeham House, Englefield Green: *Rhynchostylis coelestis.*
Horsham Orchids, Ltd., Worthing Road, Horsham: *Odontoglossum* × 'Jacquinetta' var. 'Rona Hurst.'

JOINT ROCK GARDEN PLANT COMMITTEES.—Mr. F. C. STERN, F.L.S., in the Chair, and eight other members present.

Award Recommended:—

Award of Merit.

To *Diosphaera asperuloides* as a flowering plant for the rock garden and alpine house (votes 6 for), from Messrs. W. E. Th. Ingwerson, East Grinstead. See p. 446.

Other Exhibits.

Dartington Hall, Ltd., Totnes: *Gentiana septemfida.*
Messrs. M. Prichard, Christchurch: *Viola cornuta* 'Dainty.'

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—Mr. E. CHARRINGTON in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To Border Carnation ' Limpsfield White,' for exhibition (votes unanimous), from E. Charrington, Esq., Icewood Cottage, Limpsfield. See p. 445.

To Border Carnations ' Firefly ' and ' Lady Gay,' for exhibition (votes unanimous), from Messrs. Allwood, Haywards Heath, Sussex. See p. 444.

To Border Carnation ' G. D. Murray,' for exhibition (votes unanimous), from R. Thain, Esq., Hilandale, Guildford. See p. 444.

Preliminary Commendation.

To Border Carnation ' Thora Cox,' from C. S. Cox, Esq., Branksome, Langley Road, Langley.

To Border Carnation ' Julia B. Wells,' from E. Charrington, Esq.

To Border Carnation ' Madonna,' from Messrs. Allwood.

Selected for trial at Wisley.

Border Carnation ' Thora Cox,' from C. S. Cox, Esq., Langley.

Border Carnation ' Julia B. Wells,' from E. Charrington, Esq., Limpsfield.

Border Carnations ' Firefly,' ' Madonna,' ' Lady Gay ' and ' Cottage Orange,' all from Messrs. Allwood Bros., Haywards Heath.

Border Carnation ' G. D. Murray,' from R. Thain, Esq.

Other Exhibits.

H. A. Dillingham, Esq., Bedford : Border Carnation ' Gladys Irene.'

F. J. Hayward, Esq., Maldon, Essex : Border Carnation ' Florence Hayward,' Border Carnation ' Judy ' (to be seen again).

JULY 21, 1938.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE (held at Wisley).—Mr. L. NOËL SUTTON in the Chair, and nine other members present.

Award Recommended :—

Award of Merit.

To Border Carnation ' Elizabeth Harrison,' for exhibition (votes unanimous), from Messrs. Gibson, Cranleigh. See p. 444.

Selected for trial at Wisley.

Border Carnation ' Elizabeth Harrison,' from Messrs. Gibson.

JULY 26, 1938.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—Mr. L. NOËL SUTTON in the Chair, and eight other members present.

Awards Recommended :—

Award of Merit.

To Border Carnation ' Eborian,' for exhibition (votes unanimous), from E. Charrington, Esq., Limpsfield. See p. 444.

To Border Carnation ' Unique,' for exhibition (votes unanimous), from Messrs. Allwood. See p. 445.

To Border Carnation ' Darkie,' for the open border (after trial at Wisley) (votes unanimous), from Messrs. Allwood.

Selected for trial at Wisley.

Border Carnation ' Eborian,' from E. Charrington, Esq.

Border Carnation ' Unique,' from Messrs. Allwood.

JULY 29, 1938.

JOINT BORDER CARNATION AND PICOTEE COMMITTEE.—At Wisley.—Mr. L. NOËL SUTTON in the Chair, and seven other members present.

Awards Recommended :—

Award of Merit.

To Border Carnation ' Angela Hawtin ' (votes unanimous), raised and shown by R. Thain, Esq., Hilandale, Guildford. See p. 444.

Selected for Trial at Wisley.

Border Carnation ' Angela Hawtin,' from R. Thain, Esq., Guildford.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

AUGUST 9, 1938.

FOREMARKE CUP COMPETITION.

The Foremarke Cup, for the best exhibit of twenty spikes of named Gladioli in not less than ten varieties, was awarded to Messrs. Kelway & Son, Langport.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and four other members present.

Branched Inflorescence of Veronica.—Mr. E. Brown of Cranleigh sent several shoots of a variety of *Veronica speciosa* in which about 30 per cent. of the inflorescences were branched about half-way up. This was observed in only one variety of this type.

Bulbils on Lilium longiflorum.—Col. Dwyer sent examples of bulbils on *Lilium longiflorum* with the following notes. The plants had been grown in his garden at Kilmacud House, Stillorgan, Co. Dublin.

"The Lilies sent were part of a lot of about twenty dozen imported Japanese bulbs, 'Erabu' strain. They were all potted at the same time early last October. All had the same potting compost, viz. a mixture of sand, peat, leaf-mould, and light loam; no bone meal, chemical or farmyard manure. The majority of the bulbs were potted in ten- and twelve-inch pots, the remainder in large tubs. They were grown quite cool, and brought into the open at intervals, so as to provide a succession of bloom from about mid-May up to the present time. They flowered well, all carrying from twelve to eighteen blooms to each stem. Many of the earliest flowers were split, the result, no doubt, of early undetected green-fly infestation. With the exception of three doubtful bulbs, I did not notice any mosaic. Apart from those sent for inspection by the Committee, few of the main stems showed unusual features, a few aerial bulbils springing near the soil being the most common departure from normal. A large proportion, however, of young stems, rising from scale-produced bulblets, at the side of main stems were distinctly unusual. Many of these are carrying a single good-sized bulbil at the apex of the stem, while others have in the axil of each of their leaves a single primary bulbil: one of the latter I include in the exhibit. When selecting specimens to send you I overlooked the most unusual one of all: a young stem about a foot high, springing beside a normal main stem, and bearing a profusion of bulbils, some primary, some in collateral pairs, some leaves with one primary and one collateral, and all these bulbils bearing roots and leaves, strange in a species not usually credited with a capacity for producing aerial bulbils at all.

"The whole question of aerial bulbil formation in Lilies is, I think, of much interest. I have a batch of scale-produced bulblets of *L.* × 'G. C. Creelman,' now eighteen months old, about thirty stems in all. Of these eight stems have bulbils at every leaf; the remainder show no signs of bulbils. I have for some time been trying to determine the influence of the leaf in the production and nutrition of the bulbil in its axil in species usually associated with aerial bulbil formation, so far with indefinite, or what appear even contradictory results. Thus in *L. Sargentiae* the early removal of the leaf seems to make little difference; the bulbil appears and grows as well, or nearly as well, as if the leaf were present. In *L. sulphureum*, on the other hand, if the leaf is removed early, the bulbil

either does not appear at all, or, if it does appear, grows much less vigorously than the others."

Plants referred from Floral Committee B were identified as *Hypericum Leschenaultii*, sent by Mr. A. T. Johnson, of Ro-wen, Tal-y-Cafn; and *Heliconia rostrata*, sent by Mr. L. de Rothschild, Exbury, Southampton.

Carpellody of stamens in Papaver somniferum.—Mr. Robinson showed flowers of *Papaver somniferum* with several stamens converted into carpel-like bodies (but without seeds).

Pelargonium inflorescence aberrant.—Mr. Robinson also showed a curious growth of Scarlet Pelargonium in which there was no peduncle, but the pedicelled flowers were grouped closely on the main axis of the plant at and just below its apex.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and thirteen other members present.

Exhibits.

Mr. F. Streeter, Petworth Park Gardens, Petworth, Sussex: Apricots 'New Large Early,' 'Peach' and 'Shipley.' Cherry 'Morello.' Peaches 'Alexandra Noblesse,' 'Condor,' 'Dymond,' 'Peregrine,' 'Royal George,' and 'Stirling Castle.' Plum 'Oullins Gage.' Nectarines 'Early Orange,' 'Elruge(?)', 'Humboldt' and 'Pineapple.' Red Currant 'Laxton's No. 1.' White Currant 'Versailles.'

The Committee considered that on this occasion the Peach 'Dymond' and Nectarine 'Pineapple' were the best-flavoured varieties of their kind.

Mr. T. Bevan Walker, Dickson's Drive, Chester: Tomato 'Television.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Konynenburg & Mark, Noordwyk, Holland, for Gladioli.

Silver-gilt Banksian Medal.

To Messrs. Bath, Wisbech, for Gladioli.
To Messrs. Kelway, Langport, for Gladioli.
To Messrs. Wakeley, London, for Gladioli.

Silver Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for perennial Phlox.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Stewart, Ferndown, for Gladioli.

Flora Medal.

To Messrs. B. R. Cant, Colchester, for Roses.
To Messrs. Engelmann, Saffron Walden, for Carnations and Gerberas.
To Messrs. H. W. Hall, Lymington, for Gladioli.
To Mr. E. Ladhams, Elstead, for herbaceous plants.
To Messrs. Prichard, Christchurch, for herbaceous plants.
To Mr. B. Symons-Jeune, Old Windsor, for Dahlias.

Banksian Medal.

To Messrs. Carlile, Twyford, for herbaceous plants.
To Messrs. Daniels, Norwich, for Annuals and Gladioli.
To Messrs. Hewitt, Stratford-on-Avon, for herbaceous plants.
To Mr. E. B. Le Grice, North Walsham, for Roses.
To Mr. A. Miles, Bickley, for herbaceous plants.

Selected for trial at Wisley.

Gladioli 'Clara Chivers,' 'Doug,' 'Edna,' 'Fag,' '563,' 'Fly.' 'Get,' 'Hilda Peacock,' 'Histonian,' 'Histon Triumph,' 'John Pettit,' 'Kenneth Preston,' 'Lilac Time,' 'May Thackery,' 'Mrs. Collingridge,' 'Mrs. Rumsey,' 'Old Gold,' 'Orange Perfection,' 'Pam Lack,' 'Patricia Unwin,' 'Princess Marina,' 'Scarlet Perfection,' 'Strawberry,' 'Unwin's Orange,' and 'William Copeland,' all from Messrs. Unwin, Histon.

The following Awards were recommended after trial at Wisley :—

Award of Merit.

To Gladiolus 'Anthony Eden,' from Messrs. Wakeley, London. See p. 491.
To Gladiolus 'Marjorie Styles,' from Messrs. Unwin, Histon. See p. 491.
To Gladiolus 'Tip Top,' from Messrs. Konynenburg & Mark, Noordwyk, Holland. See p. 492.

Highly Commended.

To Gladiolus ' Anna May Wong,' from Messrs. Wakeley, London. See p. 491.

To Gladiolus ' Gala Queen,' from Messrs. Unwin, Histon. See p. 491.

To Gladiolus ' Johann Sebastian Bach,' from Messrs. W. Pfitzer, Stuttgart, Germany, and Messrs. Wakeley, London. See p. 491.

To Gladiolus ' La Paloma,' from Major G. M. Churcher, Lindfield. See p. 491.

To Gladiolus ' Royal Gold,' from Messrs. Wakeley, London. See p. 492.

To Gladiolus ' Ruby Gem,' from Messrs. Unwin, Histon. See p. 492.

To Gladiolus ' Spirit of St. Louis,' from Messrs. Bath, Wisbech. See p. 492.

Other Exhibits.

Mrs. A. E. Arthur, Pitsea : *Chrysanthemum maximum* var.

Messrs. Bentall, Havering : Roses.

Messrs. Buckwell, St. Mary Cray : Rose ' Romany.'

Mr. J. C. Hawker, Dorking : Gaillardia ' J. C. Hawker.'

Mrs. Hopkinson, Coulsdon : herbaceous plants.

Mr. C. J. Howlett, Reading : seedling Phlox.

Mr. G. B. M. Souter, Chichester : varieties of *Scabiosa caucasica* (to be seen again).

Messrs. Wheatcroft, Nottingham : Roses.

FLORAL COMMITTEE B.—Mr. C. T. Musgrave, V.M.H., in the Chair, and twelve other members present.

Award Recommended :—

Preliminary Commendation.

To *Lilium* × *burnhamense* as a Lily for the cool house (votes unanimous), from Messrs. W. A. Constable, Southborough, near Tunbridge Wells.

Other Exhibits.

Mr. A. Corderoy, Eltham, Kent : rock plants.

A. T. Johnson, Esq., Tyn-y-groes, Conway, N. Wales : *Hypericum Leschenaultii*, *Leptospermum pubescens* var.

L. F. C. Rich, Esq., The Manor, Northwood : *Nephrolepis exaltata.*

L. de Rothschild, Esq., Exbury House, Southampton : *Heliconia rostrata.*

Mr. J. R. Smith, 63 Main Street, Methley, near Leeds : *Lilium chalcedonicum* var. *maculatum.*

H. H. Thomas, Esq., Gerrard's Cross : *Hydrangea arborescens* var. *grandiflora* (**A.M.** 1907).

Tregrehan Nurseries, Par, Cornwall : *Lomatia longifolia.*

E. K. Wilson, Esq., Cannizaro, Wimbledon, S.W. 19 : *Lilium.*

ORCHID COMMITTEE.—Mr. E. K. Wilson in the Chair, and seven other members present.

Award Recommended :—

Award of Merit.

To *Dendrobium* × ' Roi Albert ' (votes 7 for), from Messrs. Sanders, St. Albans. See p. 491.

Other Exhibits.

Dr. F. Craven-Moore, Duckyls, East Grinstead : *Polycycnis barbata.*

C. H. Lankester, Esq., 89 Ditton Road, Surbiton : *Polycycnis gratiosa.*

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. C. T. Musgrave, V.M.H., in the Chair, and eight other members present.

Award Recommended :—

Preliminary Commendation.

To *Gentiana Lowndesii* as a flowering plant for the rock garden and alpine house (votes unanimous), from T. Hay, Esq., New Lodge, Hyde Park.

JOINT EARLY-FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. G. W. Leak, V.M.H., in the Chair, and eleven other members present.

Exhibits.

Early-Flowering Chrysanthemums ' Marina,' ' Golden Page,' ' Sunrise,' ' Rosalie,' ' Peace,' ' Margaret ' and ' Talisman,' all from Messrs. A. A. Buckwell, Cockmanning Lane Nurseries, St. Mary Cray, Kent.

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., C.V.O., in the Chair, and seven other members present.

Selected for trial at Wisley.

Dahlia 'Rosalia,' from Mr. A. T. Barnes, Bedford.

Dahlias 'Gladys Clark' (Dec.), 'Jessie King' (Cactus) and 'Kanaka' (Cactus), all from Messrs. Stredwick, St. Leonards-on-Sea.

Other Exhibits.

Mr. F. Atkinson, Pateley Bridge; Mr. C. A. Hay, Hindhead; Mr. S. Ogg, Swanley; and Mr. F. J. Sage, Canterbury, also submitted plants to the Committee.

AUGUST 30, 1938.

SCIENTIFIC COMMITTEE.—Mr. A. D. COTTON, F.L.S., in the Chair, and three other members present.

Chimera in Gladiolus.—Mr. L. Wheway of Weston-super-Mare sent a Gladiolus in which all flowers on one side of the spike were white, those on the other white on the side next to the rhachis, red on the other half. The white had a very faint tinge of red running through it.

Bulbils on Lilium longiflorum.—Col. Dwyer sent further plants of *Lilium longiflorum* showing aerial bulb formation in the leaf axils, arising for the most part from collateral buds.

Proliferation in Scabious.—Mr. Robinson showed some heads of a Scabious which had fruited and subsequently produced shoots from the base of the fruiting calyx.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and five other members present.

Award Recommended :—

Silver Hogg Medal.

To Messrs. J. C. Allgrove, The Nursery, Middle Green, Langley, Slough : for collection of Peach, Nectarine, Plum, Pear, and Fig trees in pots.

FLORAL COMMITTEE A.—Mr. W. R. OLDHAM, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Gold Medal.

To Mr. S. Ogg, Swanley, for Dahlias.

Silver-gilt Banksian Medal.

To Messrs. Carter Page, London, for Dahlias.

Silver Flora Medal.

To Messrs. Brown & Such, Maidenhead, for Dahlias.

Silver Banksian Medal.

To Messrs. B. R. Cant, Colchester, for Roses.
To Messrs. Cheal, Crawley, for Dahlias.
To Messrs. Daniels, Norwich, for Gladioli and other hardy plants.
To Messrs. Kelway, Langport, for Gladioli.
To Messrs. Prichard, Christchurch, for herbaceous plants.
To Mr. B. Symons-Jeune, Old Windsor, for Dahlias.
To Mr. H. Woolman, Birmingham, for Begonias.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses.
To Mr. E. Ladhams, Elstead, for herbaceous plants.
To Mr. E. B. Le Grice, North Walsham, for Roses.
To Messrs. Lowe, Crawley Down, for Dahlias.

Banksian Medal.

To Messrs. Bentall, Havering, for Roses.
To Messrs. Carlile, Twyford, for herbaceous plants.
To Messrs. Engelmann, Saffron Walden, for Carnations.
To Mrs. H. W. Hall, Lymington, for Gladioli.
To Mr. A. Miles, Bickley, for herbaceous plants.
To Messrs. Wakeley, London, for Gladioli.

Preliminary Commendation.

To *Dianthus barbatus* 'Blue' (votes unanimous), from Messrs. Allwood, Haywards Heath.

Selected for trial at Wisley.

Centaurea dealbata Steenbergii, from Messrs. Prichard, Christchurch.

Eschscholzia ' Sesame,' from Messrs. Hurst, London.

Gladiolus ' Bleeding Heart '
Gladiolus ' Rapture '
Gladiolus ' Stressa '
} from Messrs. Wakeley, London.

The following Awards were recommended after trial at Wisley :—

Award of Merit.

To Fuchsia ' Tom Thumb,' from Messrs. Redgrove & Patrick, Sevenoaks.

To Lobelia (Perennial) ' Elstead Pink ' (subject to rename), from Mr. E. Ladhams, Elstead.

To Lobelia (Perennial) ' Queen Victoria Improved,' from Mr. A. Falconer, Stamford Park, Stalybridge.

To *Physostegia virginica intermedia rubra*, from Messrs. Perry, Enfield.

Highly Commended.

To Lobelia (Perennial) ' The Test,' from Messrs. Wells, Merstham, and Mr. E. Ladhams, Elstead.

To Lobelia (Perennial) ' Gerardi,' from Messrs. Forbes, Hawick.

Other Exhibits.

Mrs. W. H. Hall, Lymington : Gladiolus ' Rosy Minor.'

Mrs. Hopkinson, Coulsdon : herbaceous plants.

Mr. E. B. Le Grice, North Walsham : Rose ' Harmony ' and Rose ' Little Miss Muffett.'

Messrs. Wheatcroft, Nottingham : Roses.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Lindley Medal.

To W. O. Roy, Esq., Montreal, for *Trillium grandiflorum* grown from retarded roots.

Banksian Medal.

To Dartington Hall, Ltd., Totnes, for hardy heaths.

To Mr. J. Klinkert, Richmond, for clipped trees.

To Messrs. Prichard, Christchurch, for rock garden plants.

To Messrs. Russell, Windlesham, for Clematis and other shrubs.

To Messrs. Southgate, New Malden, for succulents.

Other Exhibits.

Mr. A. Corderoy, Eltham : rock garden plants.

Admiral A. Walker-Heneage-Vivian, Swansea : *Abutilon sinense, A.* ' Dazzle,' *Cassia corymbosa.*

ORCHID COMMITTEE.—LIONEL DE ROTHSCHILD, Esq., in the Chair, and eight other members present.

No Awards were recommended on this occasion.

Exhibits.

Colonel Ramsden-Jodrell, C.M.G., Taxal Lodge, Whaley Bridge, Stockport : *Disa uniflora* (*grandiflora*).

F. E. Griggs, Esq., Chislehurst, Kent : *Vanda coerulea.*

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., C.V.O., in the Chair, and eight other members present.

Selected for trial at Wisley.

From Messrs. Cheal, Crawley : Dahlia ' Gatwick Star ' (Star).

From A. J. Cobb, Esq., Reading : Dahlia ' Liberty Silk ' (Min. Paeony).

From Messrs. J. E. Spencer, Hockley : Dahlia ' Firerays,' ' Len Hutton,' ' Marjorie Spencer.'

From Messrs. Stredwick, St. Leonards-on-Sea : Dahlia ' Formality ' (Dec.), ' How Sweet ' (Pompon), ' John Woolman ' (Dec.), ' Nightfall ' (Cactus), ' Rapture ' (Semi-Cactus), ' Rebellion ' (Cactus), ' Snowball ' (Cactus), ' Togo ' (Pompon).

Dahlias were also submitted by A. Griffiths, Esq., London.

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. D. INGAMELLS in the Chair, and eleven other members present.

Awards Recommended :—

Award of Merit.

To Early Flowering Chrysanthemum 'Jim Tomlinson,' as a variety for exhibition (votes unanimous), shown by Mr. H. Woolman, Shirley, Birmingham. See p. 491.

Other Exhibits.

Early Flowering Chrysanthemum 'Brenda,' syn. 'Bronze Early Buttercup,' shown by Mr. E. Kettle, The Forage, Milford Road, Catford.

Early Flowering Chrysanthemum 'Suzy,' from Mr. R. Paine, Partwick Nursery, Henfield, Sussex.

Early Flowering Chrysanthemum 'Paramount,' from Mr. E. Riley, Brookside Nurseries, Alfreton.

BOOKS AND PAMPHLETS ADDED TO THE LIBRARY IN THE YEAR ENDING DECEMBER 31, 1937.

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Abbreviations.—Col. pls. = coloured plates; illus. = illustrated or illustrator; ed. = editor, edited or edition; fol. = folio; trans. = translation.

For books published in London, the place of publication is not named in the entry.

Abbiss, Harry Walter. Potato production in Cornwall. 8vo. [Truro], 1937. (1)

—— The cultivation of anemones. (Market Grower and Salesman.) Illus. 8vo. n.p. 1937. (1)

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(*To be continued.*)

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

SEPTEMBER 6, 1938.

ALPINE GARDEN SOCIETY'S SHOW.

JOINT ROCK-GARDEN PLANT COMMITTEE.—F. C. STERN, Esq., F.L.S., in the Chair, and twelve other members present.

Awards Recommended :—

Award of Merit.

To *Meconopsis bella* as a flowering plant for the rock garden (votes unanimous), from R. B. Cooke, Esq., Corbridge, Northumberland. See p. 543.

To *Limonium* (*Statice*) *asparagoides* as a flowering plant for the alpine house (votes 9 for), from H. D. Ripley, Esq., Horam, E. Sussex. See p. 543.

Preliminary Commendation.

To *Ourisia microphylla* as a flowering plant for the alpine house (votes unanimous), from Dr. P. L. Giuseppi, Felixstowe.

Cultural Commendation.

To R. B. Cooke, Esq., for *Meconopsis bella*.

Other Exhibits.

Dr. P. L. Giuseppi: *Rhododendron crebreflorum, Sedum Chaneti, Witsenia corymbosa.*

Mrs. A. S. Griffith, Newnham, Cambridge: *Cupressus obtusa*, Roger's No. 2 and No. 50, *Rhododendron impeditum* var.

Captain H. P. Leschallas, Prestbury: *Aquilegia Jonesii.*

H. D. Ripley, Esq.: *Trachelium lanceolatum.*

Dr. Hugh Roger-Smith, Capel, Surrey: *Saponaria cypria.*

Mrs. Scott-Moncrieff, Ubbeston, Halesworth: *Convolvulus sp.*

NATIONAL DAHLIA SOCIETY'S SHOW.

JOINT DAHLIA COMMITTEE.—Mr. J. B. RIDING in the Chair, and eight other members present.

Dahlias selected for trial at Wisley.

'Netta,' from S. C. Bailey, Esq., Hinckley.

'Consul General Quist,' 'Enkart Prima,' from Messrs. J. G. Ballego, Leiden, Holland.

'Lady Scarlett,' from J. F. Barwise, Burnley.

'Deurne's Pink Beauty,' from Monsieur E. Berckelaers, Deurne-Anvers, Belgium.

'Astarte,' 'Dominant,' 'Little Diamond,' 'No. 1910,' 'Scarlet Leader,' 'Vondel,' from Messrs. Bruidegom, Baarn, Holland.

'Grand,' 'No. 33,' from Messrs. Carlée, Haarlem, Holland.

'D. E. Smith,' from A. J. Cobb, Esq., Reading.

'Peer Gynt,' 'Punctueel,' from Messrs. Dekker, Velsen, Holland.

'Fleuristerie St. Pierre,' 'Madame Maurice De Wulf,' 'Yellow Baby,' from Messrs. Derudder & Trebaut, Bloemistery St. Dorathea, Gent, Belgium.

'Little Pat,' from H. T. Glover, Esq., Hastings.

'Our Baby,' from E. C. Goble, Esq., Ryde.

'Ruby' (to be renamed), from A. Griffiths, Esq., O.B.E., London, S.E. 24.

'Snow White,' from Messrs. Jarman, Chard.

'Sonnet,' 'Tip,' from Mr. K. Maarse, Aalsmeer, Holland.

'Miss Wilrijck,' 'Nagel's Giant,' from Monsieur E. Nagels, Wilrijk les Anvers, Belgium.
'Delicata,' 'National,' from Messrs. Stredwick, St. Leonards-on-Sea.
'Paula Deetjen,' from Messrs. W. Topsvoort, Aalsmeer, Holland.
'Kendal Beauty,' from C. Webb, Esq., Kendal.
'Fred Windibank,' from F. C. Windibank, Esq., Liphook.

Dahlias were also submitted by Messrs. Andries, Grimmingen, Belgium; Madame Charles, Moere-Moerdijck, Belgium; Messrs. Cheal, Crawley; Mr. E. J. Coates, Shrivenham; Messrs. de Ruyter, Oegstgeest, Holland; Mr. G. Elsom, Spalding; Mr. L. A. Hoek, The Hague, Holland; Madame Jean Reuter, La Pinte-Gand, Belgium; Monsieur R. Troquay, Boirs, Liège, Belgium; Messrs. van Tubergen, Haarlem, Holland.

SEPTEMBER 13, 1938.

CACTI AND SUCCULENT COMPETITION.

The Silver Trophy, provided from Mrs. Sherman Hoyt's Prize Fund, for the best group of Cacti and/or succulents staged by an amateur, was awarded to Mr. P. V. Collings, New Barnet.

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and six other members present.

Nerine flexuosa. A bulbous plant from Basutoland, collected and sent by Mrs. Milford, was identified as a variety of *Nerine flexuosa.*

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Exhibits.

Mr. E. A. Bunyard, Allington, Maidstone: Pea Bean.
Mr. R. W. F. Cartwright, Aynho Park, Banbury, Oxon: Peach 'Nectarine Peach.'
Mr. G. Cave, 85 Fairview Road, Stevenage: Alpine Strawberry 'Cresta.'
Mr. W. H. Divers, Westdean, Hook, nr. Surbiton: Plum 'Weirton Gage.'
Messrs. Laxton, Bedford: Blackberry 'Bedford Giant.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

Silver-gilt Flora Medal.
To Messrs. Dobbie, Edinburgh, for Dahlias.
To Messrs. Kelway, Langport, for Gladioli.
To Mr. S. Ogg, Swanley, for Dahlias.

Silver-gilt Banksian Medal.
To Messrs. Dickson, Newtownards, for Roses.

Silver Flora Medal.
To Messrs. Baker, Codsall, for herbaceous plants.
To Messrs. Cheal, Crawley, for Dahlias.
To Messrs. Gregory, Chilwell, for Roses.
To Messrs. Wakeley, London, for Gladioli.
To Messrs. Vinten, Balcombe, for Chrysanthemums.

Silver Banksian Medal.
To Messrs. Brown & Such, Maidenhead, for Dahlias.
To Mr. E. Ladhams, Elstead, for herbaceous plants.
To Messrs. Prichard, Christchurch, for herbaceous plants.
To Mr. B. Symons-Jeune, Old Windsor, for Dahlias.
To Mr. J. T. West, Brentwood, for Dahlias.

Flora Medal.
To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Daniels, Norwich, for Gladioli, Annuals, etc.
To Messrs. Engelmann, Saffron Walden, for Carnations and Gerberas.
To Mr. A. Miles, Bickley, for herbaceous plants.
To Messrs. Perry, Enfield, for Kniphofias.

Banksian Medal.
To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses.
To Messrs. B. R. Cant, Colchester, for Roses.
To Messrs. Carlile, Twyford, for herbaceous plants.
To Mr. E. B. Le Grice, North Walsham, for Roses.

Selected for trial at Wisley.
Gladiolus ' Vagabond Prince,' from Messrs. Kelway, Langport.

Other Exhibits.
Messrs. Buckwell, St. Mary Cray : Chrysanthemums and Rose ' Doris Moore.'
Messrs. Clark, Dover : herbaceous plants.
Messrs. Gibson (Cranleigh) Ltd., Cranleigh : Dahlias.
Mrs. Hopkinson, Coulsdon : herbaceous plants.
Messrs. Kelway, Langport : exhibit to demonstrate the parentage of Gladiolus ' Vagabond Prince ' and the results obtained by crossing popular varieties of Gladioli.
Messrs Carter Page, London : Dahlias.
Mr. S. Stepney, Mitcham : *Pelargonium* ' Fire Dragon ' and *P.* ' Gloria.'
Messrs. Wheatcroft, Nottingham : Roses.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.
To Messrs. Hillier, Winchester, for flowering shrubs.

Flora Medal.
To Messrs. Cheal, Crawley, for flowering shrubs.
To Hocker Edge Gardens, Cranbrook, for Gentians and other hardy plants.
To Mr. L. Lawrence, Taplow, for succulents.
To Messrs. Russell, Windlesham, for Clematis and other shrubs.

Banksian Medal.
To Dartington Hall, Ltd., Totnes, for hardy heaths.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Messrs. Maxwell & Beale, Broadstone, for hardy heaths.
To Messrs. Neale, Worthing, for succulents.
To Messrs. Southgate, New Malden, for succulents.

Award of Merit.
To *Calluna vulgaris alba flore pleno* as a hardy flowering shrub (votes unanimous), from Messrs. Maxwell & Beale, Broadstone. See p. 541.

Other Exhibits.
Mr. A. Corderoy, Eltham : rock garden plants.
Mrs. Helen Milford, Chedworth : *Nerine flexuosa* var.
Messrs. Prichard, Christchurch : *Sedum maximum giganteum, Boltonia latisquama rosea.*
Messrs. Russell, Windlesham : *Rhododendron javanicum* var.
F. C. Stern, Esq., Goring-by-Sea : *Amaryllis Parkeri.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and eight other members present.

No awards were recommended on this occasion.

Exhibits.
Messrs. Stuart Low, Jarvis Brook : a group of Orchids.
F. E. Griggs, Esq., The Spinney, Chislehurst : *Laeliocattleya* × ' Theomus.'

JOINT ROCK-GARDEN PLANT COMMITTEE.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and five other members present.

Awards Recommended :—

Preliminary Commendation.
To *Gentiana Waltonii* as a flowering plant for the rock garden (votes unanimous), from F. C. Stern, Esq., F.L.S., Goring-by-Sea.

Other Exhibits.
Mrs. H. A. Milford, Chedworth, Glos : *Hesperantha sp.*
Major F. C. Stern, F.L.S., Goring-by-Sea : *Crocus vallicola.*

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. D. INGAMELLS in the Chair, and eight other members present.

Award Recommended :—

Award of Merit.

To Early Flowering Chrysanthemum 'Yellow Wendy,' for show and market (votes unanimous), from Messrs. Lambert Bros., Aspley, Nottingham. See p. 543.

To Early Flowering Chrysanthemums 'Tibshelf Glory' for show (votes unanimous), 'Spartan' for show (votes unanimous), 'Ardent' for show (votes unanimous), and 'Early Marvel' for show (votes 6 for, 2 against), all shown by Messrs. J. and T. Johnson, Tibshelf, Derbyshire. See p. 542.

Selected for Trial at Wisley.

Early Flowering Chrysanthemums 'Golden Crest,' 'Wealthy,' 'Elsie Haynes Carter' and 'John Woodin,' all shown by Messrs. A. A. Buckwell & Sons, Cockmannings Lane Nurseries, St. Mary Cray, Kent.

Early Flowering Chrysanthemums 'Goldmine,' and 'Ardent,' from Messrs. J. and T. Johnson, Tibshelf, Derbyshire.

Early Flowering Chrysanthemums 'Floramede,' 'Gladiator,' and 'A. J. Cobb,' all from Mr. H. Woolman, Shirley, Birmingham.

Other Exhibits.

Mr. H. Lowe, Vicar Lane Nurseries, Tibshelf, Derbyshire: Early Flowering Chrysanthemum 'Illuminous.'

Messrs. A. A. Buckwell, St. Mary Cray, Kent: Early Flowering Chrysanthemums 'Peach Blossom,' 'Nora Porter,' 'Elsie,' 'Marina' and 'Fantasy.'

Messrs. J. and T. Johnson, Tibshelf, Derbyshire: Early Flowering Chrysanthemums 'Fawn,' 'Content,' and 'Dusky Maid.'

Mr. H. Woolman, Shirley, Birmingham: Early Flowering Chrysanthemums, 'Leo,' 'Firefly,' and 'Alletra.'

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., C.V.O., in the Chair, and seven other members present.

Dahlias selected for trial at Wisley.

'Braywick Beauty,' 'Braywick Bedder,' from Messrs. Brown & Such, Maidenhead.

Dahlias were also submitted by Messrs. Ballego, Leiden, Holland: Mr. E. J. Barker, Ipswich; Messrs. Buckwell & Denson, Sidcup Hill; A. J. Cobb, Esq., Reading; Messrs. Spencer, Hockley.

SEPTEMBER 20, 1938.

NATIONAL CHRYSANTHEMUM SOCIETY'S SHOW.

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. D. INGAMELLS in the Chair, and twelve other members present.

Awards Recommended :—

Award of Merit.

To Chrysanthemum 'Orpington Gem,' as an exhibition variety (votes unanimous, from Messrs. A. A. Buckwell & Sons, St. Mary Cray, Kent. See p. 542.

To Chrysanthemum 'Dr. George Barnes,' as an exhibition variety (votes unanimous), from Mr. H. Woolman, Shirley, Birmingham. See p. 542.

To Chrysanthemum 'Terra-Cotta Freda,' as an exhibition variety (votes unanimous), from Mr. W. H. Dixson, Horsham Nurseries, Broadbridge Heath, Sussex. See p. 542.

To Chrysanthemum 'Immaculate' and 'Excelda,' as exhibition varieties (votes unanimous), both from Messrs. J. & T. Johnson, Tibshelf, Derbyshire. See p. 542.

To Chrysanthemum 'Adventure,' as an exhibition variety (votes unanimous), from Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire. See p. 541.

Selected for trial at Wisley.

'Swansdown' and 'Redcap,' from Mr. H. Lowe, Vicar Lane Nurseries, Tibshelf, Derbyshire.

'Incurved Autumn Gold,' from Messrs. Greenyer Bros., Broadwater Nurseries, Worthing, Sussex.

'Chieftain,' from Messrs. A. A. Buckwell & Sons, St. Mary Cray, Kent.

'Dr. George Barnes,' from Mr. H. Woolman.

'Terra-Cotta Freda,' from Mr. W. H. Dixson.

' Sandcliffe Bronze,' from Mr. Wm. Bennett, Sandcliffe Nurseries, Midway, Burton-on-Trent.

' Yellow Wendy,' from Messrs. Sherratts, Burton-on-Trent.

' Immaculate ' and ' Lorna,' from Messrs. J. and T. Johnson.

' Fanfare,' ' Garden Red,' ' Courageous ' and ' Sunkist,' from Mr. E. Riley.

Other Exhibits.

Mr. H. Lowe, Tibshelf, Derbyshire: ' Mrs. W. A. F. Hurst,' ' Lascar,' ' Red Indian ' and ' Golden Dawn.'

Messrs. A. A. Buckwell, St. Mary Cray, Kent: ' Peach Blossom,' ' Reward,' ' Charmer,' and ' Rapture.'

Mrs. D. R. Moore, Shapwick Nurseries, Farnborough, Kent: ' Nannette ' and ' Goddington Glory.'

Mr. H. Woolman, Shirley, Birmingham: ' Antelope,' ' Lemonia ' and ' Puritan.'

Mr. H. G. Featherby, The Vineries, Gillingham, Kent: ' Peggy.'

Mr. Wm. Bennett, Burton-on-Trent: ' Allan Bennett ' (syn. ' Unique ').

Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire: ' Fairy Light,' Autumn Tints ' and ' Alfreton Beauty.'

SEPTEMBER 27, 1938.

Mr. C. T. MUSGRAVE, V.M.H., in the Chair.

A lecture was given by Mr. E. A. Bowles, F.L.S., V.M.H., on " Flowers in Season."

SCIENTIFIC COMMITTEE.—Dr. M. A. H. TINCKER, M.A., in the Chair, and four other members present.

Virescence in Helenium and Gaillardia. Mr. F. G. Preston showed several examples of virescent and proliferous capitula of Helenium and Gaillardia. This phenomenon is common and at least at times in Helenium persists from year to year. It was described in the JOURNAL, vol. 27, p. 943.

Fasciation in Callistephus.—An inflorescence showing two perfect capitula placed back to back each with a complete involucre was shown.

Berberis pruinosa.—A well-fruited specimen of *Berberis pruinosa* shown by Mr. Collingwood Ingram was referred to the Committee from Floral Committee B.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and eleven other members present.

Exhibit.

Mr. F. Streeter, Petworth Park Gardens, Petworth, Sussex: Plum ' Coe's Golden Drop.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Bees, Chester, for herbaceous plants.

To Pierpont Morgan, Esq. (gr. Mr. F. H. Steward), Watford, for Gesneras and other greenhouse plants.

Silver-gilt Flora Medal.

To Messrs. Kelway, Langport, for Gladioli.

To Messrs. Waterer Sons & Crisp, Twyford, for herbaceous plants.

Silver-gilt Banksian Medal.

To Messrs. Dickson, Newtownards, for Roses.

To Messrs Wood, Taplow, for Michaelmas Daisies.

Silver Flora Medal.

To Messrs. Barr, London, for Michaelmas Daisies and other herbaceous plants.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. Carter Page, London, for Dahlias.

To Mr. J. T. West, Brentwood, for Dahlias.

Silver Banksian Medal.

To Mr. E. Ballard, Colwall, for Michaelmas Daisies.
To Messrs. Baker, Codsall, for herbaceous plants.
To Mr. E. Ladhams, Elstead, for herbaceous plants.
To Messrs. Luxford, Sawbridgeworth, for Chrysanthemums.
To Mr. A. Miles, Bickley, for herbaceous plants.
To Messrs. Vinten, Balcombe, for Chrysanthemums.
To Messrs. Wakeley, London, for Gladioli.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Lawrence, Chatham, for Chrysanthemums.
To Messrs. McGredy, Portadown, for Roses.
To Mr. B. H. B. Symons-Jeune, Old Windsor, for Dahlias.

Banksian Medal.

To Mr. W. E. B. Archer & Daughter, Sellindge, for Roses.
To Messrs. Brown & Such, Maidenhead, for Dahlias.
To Messrs. B. R. Cant, Colchester, for Roses.
To Messrs. Carlile, Twyford, for herbaceous plants.
To Messrs. Engelmann, Saffron Walden, for Carnations.
To Messrs. Laxton, Bedford, for Roses.
To Mr. E. B. Le Grice, North Walsham, for Roses.
To Messrs. S. Low, Enfield, for Carnations.
To Messrs. Neale, Solihull, for Dahlias.
To Mr. Amos Perry, Enfield, for *Chrysanthemum rubellum* ' Anna Hay.'
To Messrs. Prichard, Christchurch, for herbaceous plants.

Award of Merit.

To Rose ' Orange Nassau ' (votes unanimous), from Mr. Jan Spek, Boskoop, Holland. See p. 544.

Selected for trial at Wisley.

Aster novi-belgii ' Hilda Ballard,' ' Mammoth ' and ' Princess Marie Louise,' all from Mr. E. Ballard, The Court, Colwall, nr. Malvern.

Chrysanthemum rubellum ' Anna Hay,' from Mr. Amos Perry, Hardy Plant Farms, Enfield, Middlesex.

Dahlias ' Hurstwood,' ' Onaway ' and ' Rosalind ' (to be renamed), from Mr. J. F. Barwise, Towneley Nurseries, Burnley.

Dahlia ' Kristina,' from Messrs. Burrell, Howe House Nurseries, Cambridge.

Dahlias ' Dr. Derrick Martin,' ' Olive Hearn,' ' Quill ' and ' The Admiral,' from Messrs. Stredwick, Silverhill Park, St. Leonards-on-Sea.

Dahlia ' Alloway,' from Messrs. Torrance & Hopkins, Meadow Nurseries, Busby, Glasgow.

Gladioli ' Golden Goddess,' ' Mary Elizabeth ' and ' Siegfried,' from Messrs. Wakeley, London.

Awards Recommended after trial at Wisley :—

Award of Merit.

To *Aster Amellus* ' Heinrich Siebert,' from Messrs. Prichard, Riverslea Nurseries, Christchurch. See p. 541.

To *Aster Amellus* ' Moerheim Gem,' from Messrs. Prichard. See p. 541.

To *Aster novi-belgii* ' Petunia,' from Mr. E. Ballard, The Court, Colwall, nr. Malvern. See p. 541.

[Owing to the absence of the necessary quorum of the Joint Dahlia Committee, Dahlias were dealt with by Floral Committee A.]

Other Exhibits.

Messrs. Ballego, Leiden, Holland : Dahlias.
Messrs. Bentall, Havering : Roses.
Messrs. F. Cant, Colchester : Roses.
Mr. E. C. Goble, Ryde : Dahlias.
Mrs. Hopkinson, Coulsdon · herbaceous plants.
Mr. C. H. Kettle, Corfe Mullen : Violets.
Mr. H. G. Longford, Marcham : *Chrysanthemum rubellum.*
Marsden Nurseries, Ashtead : herbaceous plants.
Mr. W. F. Rowles, Bury St. Edmunds : Aster ' Little Pink Jewel.'
Rev. W. Shirley, Oxford : seedling Dahlias.
A. Langley Smith, Esq., Catford : hybrid scented-leaved Pelargoniums.
Mr. J. S. Wallis, Histon : Dahlias.
Messrs. Wheatcroft, Nottingham : Roses.
Widbrook Nurseries, Cookham : herbaceous plants.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and twelve other members present.

Awards Recommended :—

Flora Medal.

To Messrs. Cheal, Crawley, for berried and foliage shrubs.
To Messrs. Hillier, Winchester, for foliage and flowering shrubs.
To Hocker Edge Gardens, Cranbrook, for Lilies, Gentians and Colchicums.
To Mr. E. Ladhams, Elstead, for rock garden plants.
To Messrs. Russell, Windlesham, for Crotons and other greenhouse plants.

Banksian Medal.

To Messrs. Constable, Southborough, for Lilies and Nerines.
To Dartington Hall, Ltd., Totnes, for flowering shrubs.
To Messrs. Hollamby, Groombridge, for flowering shrubs.
To Messrs. Jackman, Woking, for Clematis.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Messrs. Maxwell & Beale, Broadstone, for hardy heaths.
To Messrs. Southgate, New Malden, for succulents.

Award of Merit.

To *Aeschynanthus speciosus* as a flowering plant for the warm greenhouse (votes 10 for), from B. Ionides, Esq., Buxted Park, Sussex. See p. 541.

To *Podranea Ricasoliana* (syn. *Tecoma Mackenii*) as a flowering plant for the cool house (votes unanimous), from Mrs. H. W. Hall, Lymington. See p. 544.

Other Exhibits.

Collingwood Ingram, Esq., Benenden : *Berberis pruinosa* (**A.M.** 1924).
Mr. A. Corderoy, Eltham : rock garden plants.
Mr. K. W. Harle, Lower Basildon : succulents.
P. M. Synge, Esq., West Byfleet : *Crinum Johnstonii.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and nine other members present.

Award Recommended :—

Cultural Commendation.

To Messrs. Armstrong & Brown, Tunbridge Wells, for *Eria hyacinthoides* (votes unanimous), with nine many-flowered spikes. The plant received an **A.M.** December 12, 1933.

Other Exhibits.

Messrs. Charlesworth, Haywards Heath : a group of Orchids.
Messrs. Sanders, St. Albans : a group of Orchids.
Messrs. Stuart Low, Jarvis Brook : a group of Orchids.
E. Kenneth Wilson, Esq., Wimbledon : *Sophrolaeliocattleya* × 'Nanette.'
F. E. Griggs, Esq., Chislehurst : *Cycnoches chlorochilon.*
Messrs. H. G. Alexander, Tetbury : *Laeliocattleya* × 'Campagna.'

JOINT ROCK-GARDEN PLANT COMMITTEE.—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and seven other members present.

There was no business before the Committee on this occasion.

JOINT EARLY FLOWERING CHRYSANTHEMUM COMMITTEE.—Mr. C. H. CURTIS, V.M.H., in the Chair, and nine other members present.

Awards Recommended :—

Award of Merit.

To Chrysanthemum 'Alfreton Beauty,' as an exhibition variety (votes 8 for), from Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire. See p. 541.

Selected for trial at Wisley.

'Nannette,' from Mrs. D. R. Moore, Shapwick Nurseries, Farnborough, Kent.
'Laureate' and 'Vulcan,' from Messrs. J. and T. Johnson, Tibshelf, Derbyshire.

Other Exhibits.

Mr. H. Lowe, Vicar Lane Nurseries, Tibshelf, Derbyshire : 'Grandeur' and 'Swansdown.'

Messrs. A. A. Buckwell, Cockmannings Lane Nurseries, St. Mary Cray, Kent : 'Sovereign,' 'Sunrise,' and 'Parson's Beauty.'

Mrs. D. R. Moore, Shapwick Nurseries, Farnborough, Kent : 'Goddington Glory,' 'Trevor Moore,' 'Nancy,' 'Goddington Gem,' and 'Robert Clifton.'

BOOKS AND PAMPHLETS ADDED TO THE LIBRARY IN THE YEAR ENDING DECEMBER 31, 1937 (cont. from p. cxxiv).

(For references 1–6, C, see p. cxxiii).

7 = Presented by Boron Agricultural Bureau.
8 = ,, ,, Mr. Peter Davies.
9 = ,, ,, Lord Rosse.
10 = ,, ,, Miss Quinton.
11 = ,, ,, Rubber Growers' Association.
12 = ,, ,, Lund University Library.
13 = ,, ,, Mr. F. R. Durham.
14 = ,, ,, the Director, Royal Botanic Gardens, Kew.
15 = ,, ,, the Director, John Innes Horticultural Institution.
16 = ,, ,, Mrs. Henry R. Rea.
17 = ,, ,, Mr. J. C. Bennett.
18 = ,, ,, Mr. S. Aki.
19 = ,, ,, Musée Cantonal d'Histoire Naturelle, Fribourg.
20 = ,, ,, Mr. F. E. Taylor.
21 = ,, ,, Mrs. A. E. Watkins.

Abbreviations.—Col. pls. = coloured plates; illus. = illustrated or illustrator; ed. = editor, edited or edition; fol. = folio; trans. = translation.

For books published in London, the place of publication is not named in the entry.

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EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETINGS.

OCTOBER 11 AND 12, 1938.

FRUIT AND VEGETABLE SHOW.

CHIEF AWARDS IN THE COMPETITIVE CLASSES FOR FRUIT AND VEGETABLES.

FRUIT.

The Gordon-Lennox Challenge Cup, for the most meritorious display of fruit staged by an amateur in the competitive classes.
To Lieut.-Colonel Sir Randolf Baker, Bt., D.S O, Blandford (gr. Mr. A. E. Usher).

The George Monro Memorial Challenge Cup, for the best exhibit of Grapes staged by an amateur in the competitive classes.
To the Rt Hon Lord Hotham, Beverley (gr. Mr. J S. Coates).

The Affiliated Societies Challenge Cup, for the best eighteen dishes of Apples and Pears staged by an Affiliated Society.
To the Limpsfield, Oxted and District Horticultural Society.

Class 1.—Collection of nine dishes of ripe dessert fruit.
First Prize, Silver Hogg Medal and £8.
To His Grace the Duke of St Albans, Bestwood Park (gr. Mr. A. Miles).

Class 2.—Collection of six dishes of ripe dessert fruit.
First Prize, Silver Hogg Medal and £5
To His Grace the Duke of Richmond and Gordon, Chichester (gr. Mr. S. Capon).

Class 3.—Collection of eight bunches of Grapes
First Prize, Silver Hogg Medal and £12.
To the Rt. Hon Lord Hotham, Beverley (gr Mr. J. S. Coates).

Class 4.—Collection of four bunches of Grapes.
First Prize, Silver Hogg Medal and £5
To Mrs. C. M Murray, Sunninghill (gr. Mr. R. Bowering).

Class 19 —Collection of twenty-four dishes of hardy fruits
First Prize, Silver Hogg Medal and £12.
To Lieut -Colonel Sir Randolf Baker, Bt., D.S O, Blandford (gr. Mr. A. E. Usher).

Class 20 —Collection of twelve dessert varieties of Apples.
First Prize, Fruiterers' Company's Silver-gilt Medal and £5.
To J. H. Louden, Esq., Wye (gr Mr J. Bond).

Class 21.—Collection of twelve culinary varieties of Apples.
First Prize, Fruiterers' Company's Silver Medal and £5.
To Sir T. Garbutt Knott, Bt, Exmouth (gr Mr R. Miflin).

Class 26.—Collection of twelve dessert varieties of Pears.
First Prize, Silver-gilt Hogg Medal and £5.
To Colonel F. J. B. Wingfield Digby, D.S.O., Sherborne Castle (gr. Mr. E. Hill).

Class 92.—Market Growers. Four British standard half-boxes of ' Cox's Orange Pippin ' Apple.
First Prize, Silver Hogg Medal and £4.
To the Kent Farm Institute, Sittingbourne.

Class 93.—Market Growers. Four British standard half-boxes of ' Laxton's Superb ' Apple.
First Prize, Silver Hogg Medal and £4.
To Mr. A. T. Hales, Newington.

Class 94.—Market Growers. Four British standard half-boxes of ' Worcester Pearmain ' Apple.
First Prize, Silver Hogg Medal and £4.
To the Hoveton Fruit Farm, Hoveton.

Class 96.—Market Growers. Four British standard boxes of ' Bramley's Seedling ' Apple.
First Prize, Silver Hogg Medal and £4.
To Mr. S. C. H. Boardman, Ludham.

Class 97.—Market Growers. Four British standard boxes of any culinary variety of Apple other than ' Bramley's Seedling.'
First Prize, Silver Hogg Medal and £4.
To Hoveton Fruit Farm, Hoveton. (Apple ' Lord Derby.')

Class 98.—Market Growers. Three one-layer boxes of ' Cox's Orange Pippin ' Apple.
First Prize, Hogg Medal and £2.
To Mr. A. T. Hales, Newington.

Class 99.—Market Growers. Three one-layer boxes of any dessert variety of Apple other than ' Cox's Orange Pippin.'
First Prize, Hogg Medal and £2.
To Rt. Hon. David Lloyd George, O.M., Churt. (Apple ' Worcester Pearmain.')

Class 100.—Market Growers. One one-layer box of a dessert variety of Apple not offered for sale in a printed catalogue or price-list before 1916.
First Prize, Hogg Medal and £1.
To Mr. A. T. Hales, Newington. (Apple ' Laxton's Superb.')

Class 101.—Market Growers. Three British standard half-boxes of ' Conference ' Pears.
First Prize, Hogg Medal and £4.
To Mr. T. Neame, Faversham.

Class 102.—Market Growers. Three one-layer boxes of ' Conference ' Pears.
First Prize, Hogg Medal and £2.
To Mr. T. Neame, Faversham.

Class 103.—Market Growers. Three one-layer boxes of ' Doyenné du Comice' Pears.
First Prize, Hogg Medal and £2.
To Mr. T. Neame, Faversham.

Class 104.—Market Growers. Three one-layer boxes of any variety of Pear other than ' Conference ' or ' Doyenné du Comice.'
First Prize, Hogg Medal and £2.
To Mr. T. Neame, Faversham. (Pear ' Pitmaston Duchess.')

Class 105.—Market Growers. A display of fruit in market packages.
First Prize, Hogg Medal and £2.
To Mr. T. Neame, Faversham.

VEGETABLES.

The R.H.S. Vegetable Challenge Cup, for the highest number of points in the vegetable classes.
To Lieut.-Colonel Sir Randolf Baker, Bt., D.S.O., Blandford (gr. Mr. A. E. Usher).

Class 201.—A table of vegetables.
First Prize, The Riddell Trophy and £16.
To Lieut.-Colonel Sir Randolf Baker, Bt., D.S.O., Blandford (gr. Mr. A. E. Usher).

Class 202.—A collection of twelve kinds of vegetables.
First Prize, The Sutton Cup and £8.
To Mrs. H. L. Hansard, Little Bookham (gr. Mr. J. Wynn).

A lecture was given by Mr. A. E. USHER on "Thirty Years an Exhibitor: Advice to Young Exhibitors." Chairman, Mr. CHARLES H. CURTIS, F.L.S., V.M.H. (See p. 553.)

SCIENTIFIC COMMITTEE.—Mr. E. A. BOWLES, M.A., F.R.E.S., F.L.S., V.M.H., in the Chair, and five other members present.

Erythraea portensis.—Mr. E. G. Baker showed specimens of *Erythraea portensis* which is established on the cliffs at Newport, Pembrokeshire, where also *Polygonum Raii* occurs. It is a species with a sprawling instead of erect habit of growth.

Variegation in Androsace Bulleyana.—Dr. Tincker showed seedlings of *Androsace Bulleyana* with variegated foliage, the variegation being mostly in the form of transverse bars. The whole of a batch of seedlings save two had shown the same peculiarity.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and thirty other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Sutton, Reading, for collection of vegetables (unanimous).

Silver-gilt Hogg Medal.

To Messrs. Bunyard, Maidstone, for collection of Apples, Grapes and Pears.

To Barnham Nurseries, Barnham, Sussex, for collection of Apples and Pears.

To Messrs. Rivers, Sawbridgeworth, Herts., for Grape and Apple trees in pots, and collection of Apples.

Silver Hogg Medal.

To Messrs. Laxton, Bedford : for collection of Apples and Pears.

Silver-gilt Knightian Medal.

To Messrs. Dobbie, Edinburgh, for collection of Potatos.

Other Exhibits.

Mr. G. C. Addy, Appledene Fruit Farm, Eastwood, Southend-on-Sea : Apple 'Sunset.'

Mr. J. A. Pateman, 15 Addison Way, Golders Green, N.W. 11 : Seedling Apple.

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Wood, Taplow, for Michaelmas Daisies.

Silver Flora Medal.

To Mr. J. T. West, Brentwood, for Dahlias.

Silver Banksian Medal.

To Messrs. Barr, London, for Michaelmas Daisies and Chrysanthemums.

To Messrs. Blackmore & Langdon, Bath, for Begonias.

To Messrs. Brown & Such, Maidenhead, for Dahlias.

To Messrs. Dobbie, Edinburgh, for Michaelmas Daisies.

To Messrs. Kelway, Langport, for Gladioli.

Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Ashington Nurseries, Ashington, for Carnations.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. Greenyer, Worthing, for Chrysanthemums.

To Mr. S. Ogg, Swanley, for Dahlias.

To Messrs. Wells, Merstham, for Michaelmas Daisies and Chrysanthemums.

Banksian Medal.

To Messrs. Carlile, Twyford, for Michaelmas Daisies and other herbaceous plants.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. A. Miles, Bickley, for Michaelmas Daisies, etc.

To Messrs. Prichard, Christchurch, for herbaceous plants.

To Messrs. Prins, Wisbech, for Kniphofias.

To Messrs. Spencer, Hockley, for Dahlias.

To Mr. W. Yandell, Maidenhead, for Chrysanthemums.

Award of Merit.

To *Chrysanthemum* 'Duke of Kent,' as a variety for show purposes (votes unanimous), from Mr. H. Woolman, Birmingham. See p. 568.

To *Chrysanthemum* 'Nellie Merritt,' as a variety for show purposes (votes 14 for, 2 against), from Mr. H. Woolman. See p. 568.

Other Exhibits.

Messrs. Bentall, Havering: Roses.
Mr. T. F. Bowden, Kensworth: Geranium 'Kensworth.'
Mrs. J. W. Broad, Reigate: Aster 'Nowood Loveliness.'
Messrs. Buckwell & Denson, Foots Cray: Chrysanthemums.
Messrs. B. R. Cant, Colchester: Roses.
Mrs. Hopkinson, Coulsdon: herbaceous plants.
Messrs. J. & T. Johnson, Tibshelf: Chrysanthemums.
Mr. C. H. Kettle, Corfe Mullen: Violets.
Marsden Nursery, Ashtead: hardy plants.
Orpington Nurseries, Orpington: Korean Chrysanthemum 'Golden Fragrance.'
Messrs. Redgrove & Patrick, Seal: Dahlias.
A. Langley Smith, Esq., Catford: scented-leaved Pelargoniums.
Widbrook Nurseries, Cookham: herbaceous plants.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver Flora Medal.

To the Corporation of Falmouth, Cornwall, for shrubs and hardy plants.

Flora Medal.

To Messrs. Cheal, Crawley, for berried and foliage shrubs.
To Messrs. Russell, Windlesham, for Clematis and foliage shrubs.
To Messrs. Stewart, Ferndown, for berried and foliage shrubs.
To Messrs. Waterer, Bagshot, for berried and foliage shrubs.
To Messrs. Whitelegg, Chislehurst, for evergreen shrubs.

Banksian Medal.

To Messrs. Burkwood & Skipwith, Kingston, for berried and foliage shrubs.
To Hocker Edge Gardens, Cranbrook, for Gentians and bulbous plants.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Mr. E. Ladhams, Elstead, for rock garden plants.
To Mr. L. Lawrence, Taplow, for succulents.
To Messrs. Maxwell & Beale, Broadstone, for hardy heaths.
To Messrs. Perry, Enfield, for Chrysanthemums and other hardy plants.

Award of Merit.

To *Crocus pulchellus* as a hardy flowering plant (votes unanimous), from A. Simmonds, Esq., West Clandon. See p. 568.

To *Fascicularia pitcairniifolia* as a flowering plant for the West of England and favoured localities elsewhere (votes unanimous), from the Corporation of Falmouth, Cornwall. See p. 568.

Other Exhibits.

Mr. A. Corderoy, Eltham: rock garden plants.
Dame Alice Godman, Horsham: *Eucomis concolor.*
The Director, R.B.G., Kew: *Lilium longiflorum eximium.*
Messrs. Prichard, Christchurch: rock garden plants.
L. de Rothschild, Esq., Exbury: *Dichorisandra thyrsiflora.*
Messrs. Russell, Windlesham: seedlings of *Saintpaulia ionantha* (**F.C.C.** 1884.)
Major F. C. Stern, Goring-by-Sea: *Rosa* sp.

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and eleven other members present.

No awards were recommended on this occasion.

Exhibits.

Messrs. Charlesworth, Haywards Heath: a group of Orchids.
Messrs. Stuart Low, Jarvis Brook: a group of Orchids.
Messrs. McBean, Cooksbridge: a group of Orchids.
The Rt. Hon. Lord Aberconway, Bodnant, Tal-y-Cafn: *Cypripedium* × 'Vestalia' ('Doris Black' × 'F. C. Puddle.')

JOINT DAHLIA COMMITTEE.—Mr. T. HAY, V.M.H., C.V.O., in the Chair, and eight other members present.

Selected for trial at Wisley.

From Mrs. Gordon Campbell, Southam : Dahlia ' Gloriana.'
From Messrs. Spencer, Hockley : Dahlia ' Hockley Bedder.'
From E. White, Esq., Rickmansworth Park : Dahlia ' Masonic Gem.'

Dahlias were also submitted by Mr. G. E. Griffiths, Edgware, and Messrs. Torrance & Hopkins, Busby.

JOINT ROCK GARDEN PLANT COMMITTEE.—There was no business before the Committee on this occasion.

OCTOBER 25, 1938.

ORCHID TROPHY COMPETITION.

The Silver Trophy for the best six Orchids exhibited by an amateur was awarded to John McCartney, Esq., Bolton.

The First Masters Memorial Lecture, 1938, was given by Mr. F. J. CHITTENDEN, F.L.S., V.M.H., on " The Behaviour of Plants." Chairman, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H.

SCIENTIFIC COMMITTEE.—Mr. A. D. COTTON, F.L.S., in the Chair, and four other members present.

Lily for naming.—A Lily grown at Wisley from a bulb received from Australia was examined. It had many of the characters of *L. leucanthum centifolium*, but the purple style of *L. Sargentiae*, and was probably a hybrid with that species.

Tavaresia grandiflora.—A Botanical Certificate was recommended for this peculiar and uncommon S. African Stapelia shown by S. G. Fiedler, Esq., of Rosehill, Claygate.

Plant aberrations.—A wheat-ear Carnation, a proliferous Lupin spike and a Chrysanthemum sporting from pink to cream were before the Committee.

Proliferation in Rhododendron.—Mr. Douglas Clarke of Hartridge House, Cranbrook, Kent, sent a shoot of Rhododendron which had produced on the current year's growth some foliage leaves, a few axillary flowers poorly developed, sessile and separated by short internodes now showing colour, mature leaves and a terminal flower bud.

FRUIT AND VEGETABLE COMMITTEE.—Mr. E. A. BUNYARD, F.L.S., in the Chair, and ten other members present.

Exhibit.

Messrs. Stuart Low, Bush Hill Park, Enfield : Pear ' Packham's Triumph.'

FLORAL COMMITTEE A.—Mr. G. W. LEAK, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Peed, West Norwood, for Begonias.

Silver Flora Medal.

To Messrs. Allwood, Haywards Heath, for Carnations and Dianthus.
To Messrs. Carter Page, London, for Dahlias.

Silver Banksian Medal.

To Messrs. Brown & Such, Maidenhead, for Dahlias.
To Messrs. Kelway, Langport, for Gladioli.
To Messrs. Spencer, Hockley, for Dahlias.
To Messrs. Wells, Merstham, for Chrysanthemums, etc.
To Messrs. Vinten, Balcombe, for Chrysanthemums.

Flora Medal.

To Messrs. Blackmore & Langdon, Bath, for Phlox, Chrysanthemums, etc.
To Messrs. Engelmann, Saffron Walden, for Carnations.
To Mr. S. Ogg, Swanley, for Dahlias.
To Messrs. Waterer, Sons & Crisp, Twyford, for Chrysanthemums and Michaelmas Daisies.
To Mr. J. T. West, Brentwood, for Dahlias.

Banksian Medal.

To Messrs. Barr, London, for Michaelmas Daisies, Nerines and Chrysanthemums.

To Messrs. Blackmore & Langdon, Bath, for Begonias.

To Messrs. B. R. Cant, Colchester, for Roses.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. S. Low, Enfield, for Carnations.

To Marsden Nurseries, Ashtead, for hardy plants.

To Mr. A. Perry, Enfield, for Korean Chrysanthemums and other hardy plants.

To Messrs. Wood, Taplow, for Michaelmas Daisies and Chrysanthemums.

Award of Merit.

To *Chrysanthemum* 'Alfred Edney' as a variety for show purposes (votes 11 for, 3 against), from Mr. H. Woolman, Shirley, Birmingham. See p. 568.

To *Chrysanthemum* 'Annie Curry' as a variety for show purposes (votes unanimous), from Mr. H. Woolman. See p. 568.

To *Chrysanthemum* 'Delarosa' as a variety for show purposes (votes unanimous), from Messrs. Luxford, Sawbridgeworth. See p. 568.

To *Chrysanthemum* 'Fernanda' as a variety for show purposes (votes unanimous), from Messrs. Luxford. See p. 568.

To *Chrysanthemum* 'Marius' as a variety for show purposes (votes 11 for, 3 against), from Messrs. Luxford. See p. 568.

To *Chrysanthemum* 'P. Sudbury' as a variety for show purposes (votes 11 for, 1 against), from Mr. H. Woolman. See p. 568.

To *Chrysanthemum* 'Venetia' as a variety for show purposes (votes unanimous), from Messrs. Luxford. See p. 568.

Selected for trial at Wisley.

Gypsophila 'Flamingo,' from Messrs. Baker, Codsall, Wolverhampton.

Other Exhibits.

Messrs. Buckwell, St. Mary Cray: Chrysanthemums.

Messrs. Buckwell & Denson, Foots Cray: Chrysanthemum 'Hubert Denson.'

Messrs. Carlile, Twyford: herbaceous plants.

Messrs. Gibson (Cranleigh) Ltd., Cranleigh: Chrysanthemums, Dahlias, Nerines.

Mr. B. Hooper, Plaistow: Chrysanthemum 'Madame E. Roger.'

Mrs. Hopkinson, Coulsdon: hardy plants.

Messrs. Luxford: Chrysanthemums 'Attila' (to be seen again), 'Rowena.'

Miss D. R. Moore, Farnborough: Chrysanthemums.

Mr. F. Rich, Worcester: Korean Chrysanthemums.

A. Langley Smith, Esq., Catford: Pelargonium 'Leonard W. Smith.'

Messrs. Wells, Merstham: Chrysanthemum 'Granny Scovill' (to be seen again).

Mr. W. Yandell, Maidenhead: Chrysanthemums.

FLORAL COMMITTEE B.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Cheal, Crawley, for ornamental foliage and berried shrubs.

To Messrs. Hillier, Winchester, for ornamental foliage and berried shrubs.

To Messrs. Wallace, Tunbridge Wells, for ornamental shrubs and Lilies.

To Messrs. Waterer, Bagshot, for ornamental foliage and berried shrubs.

Silver Banksian Medal.

To Mr. K. W. Harle, Lower Basildon, for succulents.

To Knap Hill Nursery, Woking, for ornamental foliage and berried shrubs.

To Mr. E. Ladhams, Elstead, for ornamental foliage and berried shrubs.

To Mr. W. J. Marchant, Wimborne, for ornamental foliage and berried shrubs.

To Messrs. Russell, Windlesham, for greenhouse foliage plants.

To Messrs. Russell, Windlesham, for Clematis and other shrubs.

Flora Medal.

To Messrs. Burkwood & Skipwith, Kingston, for flowering and berried shrubs.

To Hocker Edge Gardens, Cranbrook, for Nerines and other bulbous plants.

To Messrs. Jackman, Woking, for Clematis and other shrubs.

To Messrs. Prichard, Christchurch, for herbaceous and rock-garden plants.

To Messrs. Stewart, Ferndown, for ornamental foliage and berried shrubs.

To Mr. G. G. Whitelegg, Chislehurst, for evergreen shrubs.

Banksian Medal.

To Messrs. Baggesen, Pembury, for flowering and berried shrubs.
To Mr. J. Klinkert, Richmond, for clipped trees.
To Mr. E. Ladhams, Elstead, for rock-garden plants.
To Messrs. Maxwell & Beale, Broadstone, for heaths and other shrubs.
To Messrs. Southgate, New Malden, for succulents.

Award of Merit.

To *Schizostylis coccinea grandiflora* as a hardy flowering plant (votes unanimous), from Messrs. M. Prichard & Sons, Christchurch. See p. 569.

Other Exhibits.

W. Bentley, Esq., Newbury : *Saxifraga cortusaefolia foliis roseis.*
Messrs. Clark, Dover : shrubs and herbaceous plants.
Mr. A. Corderoy, Eltham : rock-garden plants.
G. Courtauld, Esq., Blackheath : *Hedychium Gardnerianum* (**A.M.** 1929).
Dartington Hall, Ltd., Totnes : rock-garden plants.
S. G. Fiedler, Esq., Claygate : *Tavaresia grandiflora.*
Hocker Edge Gardens, Cranbrook : Nerines and other bulbous plants.
The Director, Royal Botanic Gardens, Kew : *Lilium longiflorum eximium.*
Mr. W. J. Marchant, Wimborne : *Amelanchier grandiflora.*
Messrs. Stewart, Ferndown : *Colchicum speciosum* ' Ferndown Beauty.'
Lady Sueter, Watlington : *Billbergia rhodocyanea* (**A.M.** 1934).
P. M. Synge, Esq., West Byfleet : *Impatiens elegantissima.*
The Director, R.H.S. Gardens, Wisley : *Tricyrtis punctata.*

ORCHID COMMITTEE.—Sir JEREMIAH COLMAN, Bart., in the Chair, and fourteen other members present.

Awards Recommended :—

Award of Merit.

To *Laeliocattleya* × ' Balkis ' var. *gloriosa* (votes unanimous), from Messrs. H. G. Alexander, Tetbury, Glos. See p. 569.

Silver Banksian Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for a group of Orchids.
To Messrs. Sanders, St. Albans, for a group of Orchids.
To Messrs. Stuart Low, Jarvis Brook, for a group of Orchids.
To Messrs. H. G. Alexander, Tetbury, for a group of Orchids.
To Messrs. Charlesworth, Haywards Heath, for a group of Orchids.
To Messrs. McBean, Cooksbridge, for a group of Orchids.

Banksian Medal.

To Messrs. H. Dixon & Sons, Wandsworth, for a group of Orchids.

JOINT ROCK GARDEN PLANT COMMITTEE.—Mr. C. T. MUSGRAVE, V.M.H., in the Chair, and six other members present.

Exhibit.

Mrs. G. Anley, Woking : *Saxifraga cortusaefolia foliis roseis.*

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ERRATA.

P. 313, line 62, for *Corydalis cashmiriana*, read *Corydalis cashmeriana.*
P. 413, line 2 from bottom, for ' Zephirine,' read ' Zephirin.'
P. 456, line 7 from bottom, for *Disanthus cercidifolius*, read *Disanthus cercidifolia.*
P. xc, line 47, for *Viola septentrionale*, read *Viola septentrionalis.*
P. xcvi, line 18, for *Linaria faucicolor*, read *Linaria faucicola.*
P. cxi, line 10 from bottom, for *Centaurea macrorhiza*, read *Centaurea macrorrhiza.*

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